TECHNOLOGY DEPT

# FLIGHT

MAGAZINE

JUNE 1953
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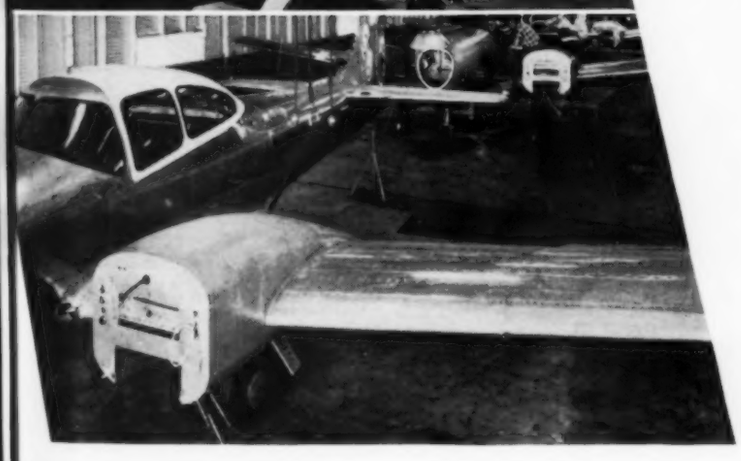

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Temco Aircraft Corporation, established in 1945 as Texas Engineering and Manufacturing Company, has grown into one of the country's major, and possibly its most varied, aircraft enterprises. Skilled engineering talent and craftsmanship have made plan into fact — accomplished wonders for U. S. Navy, USAF, foreign governments, domestic and foreign airlines. Conversion, modification, overhaul and complete manufacture of airframe are everyday jobs with Temco. From Jack Riley's Twin Navion conversion to Armed Forces jet aircraft — Temco talent and skill get the best job done in the shortest time. And the fuels and lubricants used — Mobilgas and Mobiloil.

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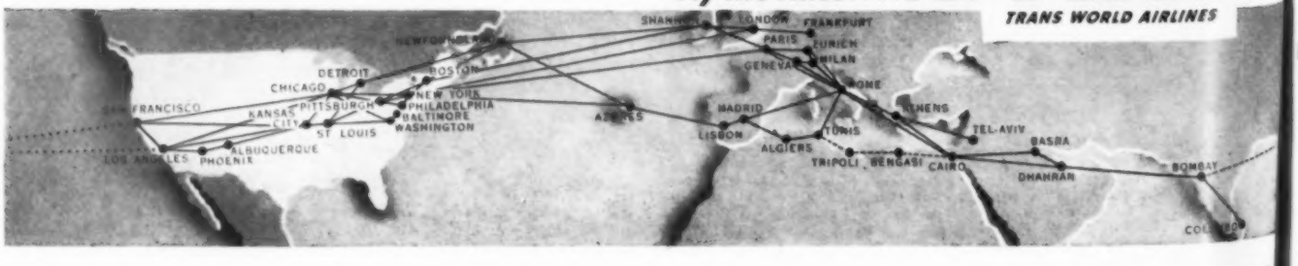
# *Tomorrow today... via* TWA

Today's down-to-earth businessman has discovered how convenient and timesaving it is to travel TWA. By using a five-mile-a-minute Constellation for all it's worth, he gets the head start that lets him tackle tomorrow's business today. He arrives refreshed – approaches each meeting with plenty of pep and plenty of time to get results. And since he's handling tomorrow's work today, doesn't that mean he can be back at *his* desk tomorrow morning?

*Where in the world do you want to go? For information and reservations call TWA or see your travel agent.*

**Fly the finest... FLY TWA**

**TRANS WORLD AIRLINES**



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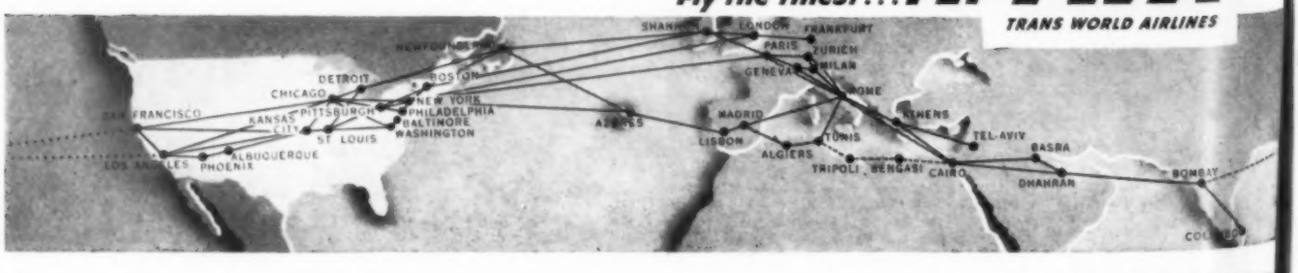

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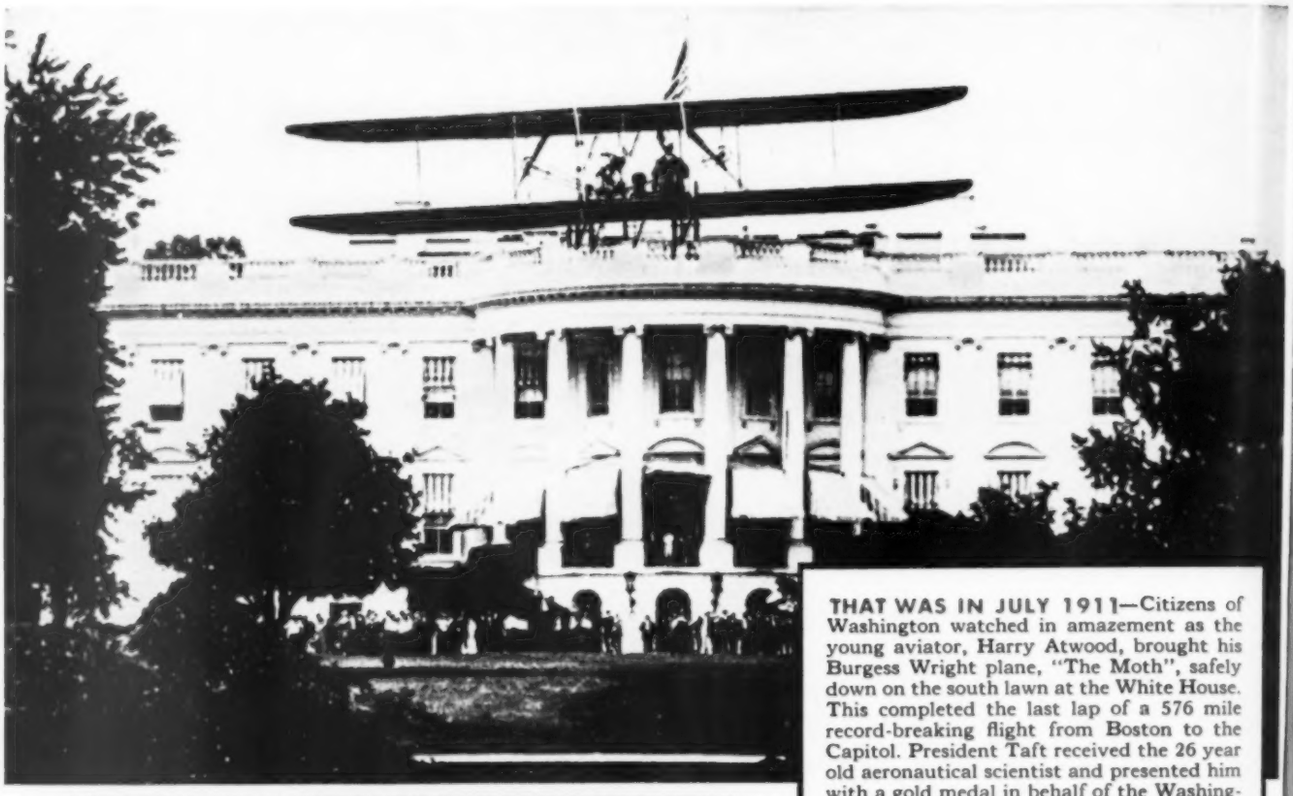
RELIABLE ENGINES

# Atwood lands at the White House!



**THAT WAS IN JULY 1911**—Citizens of Washington watched in amazement as the young aviator, Harry Atwood, brought his Burgess Wright plane, "The Moth", safely down on the south lawn at the White House. This completed the last lap of a 576 mile record-breaking flight from Boston to the Capitol. President Taft received the 26 year old aeronautical scientist and presented him with a gold medal in behalf of the Washington Aero Club. Today, Harry Atwood is still active in scientific development, particularly in plastics and electronics.

**SAME SETTING—FORTY YEARS LATER**—Aviation is today so much a part of our everyday lives that a giant Boeing B-29 in from Tokyo can fly over Washington and go virtually unnoticed by the people below.

☆ Contributing to the great progress made in the field of aeronautics, Phillips Petroleum Company has led the way in the development of improved aviation fuels.

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1903 50TH ANNIVERSARY OF THE AIRPLANE 1953

## AIR Report
### Significant Trends and News

**NO COMMERCIAL DELIVERIES OF BEECHCRAFT TWIN-BONANZAS BEFORE JULY,** 1954, are expected, Beech informed its customers and distributors last month. It offered to return, with interest, advance deposits. Demands on its facilities by increased military orders were cited as the reason. Beech is introducing three new military aircraft this year—the military Twin-Bonanza, the Mentor trainer developed from the Bonanza and ordered into large-scale production recently, and the T-36A, 12-place trainer-transport powered by two Pratt & Whitney R-2800 engines. In addition, the firm has large orders for re-building military versions of the familiar D18 twin. Latest postponement of commercial Twin-Bonanzas came as a shock to Beech distributors in view of recent indications at the factory that the Twin-Bonanzas would begin rolling off the lines last month. Beech said these expectations vanished with recent military demands on its rapidly-expanding facilities. It added that production of commercial D35 Bonanzas is being transferred to the old plant so these will not be affected by the increasing military volume.

**JET-POWERED HILLER HORNET HELICOPTERS** being produced for the military are being certificated by CAA. Commercial deliveries will thus be possible sooner than expected. Hiller may therefore become the first manufacturer to market civilian jet copters.

**BELL AIRCRAFT LOST ITS NEWEST ROCKET RESEARCH AIRPLANE,** the X-2, and two men, Jean (Skip) Ziegler, chief test pilot, and Flight Engineer Frank Walko, in a mid-air explosion at 30,000 ft. over Lake Ontario on May 12. Reports said Ziegler and Walko fell to their deaths without parachutes from the bomb bay of a B-50 bomber used as the "mother" ship in hauling the X-2 aloft on check "rides" preliminary to the beginning of powered flight tests. An explosion in the bomb bay ripped loose the X-2 and it plummeted into the lake, with Ziegler and Walker being sucked out of the bomb bay to fall into the lake. The B-50 was badly damaged but was landed safely. A second X-2 has been built, and the high-speed research project will continue with it, although the loss of Ziegler is expected to delay the schedule.

**CHANCE VOUGHT IN DALLAS WILL BUILD A NEW DAY FIGHTER FOR THE NAVY,** having won a design competition with seven other manufacturers. . . . **DOUGLAS WILL PRODUCE A NEW JET FIGHTER FOR THE NAVY,** based on its "Skyray" design.

**AIR POWER AND THE U. S. AIR FORCE SUFFERED A HEAVY SETBACK** last month with Secretary of Defense Wilson's recommendation for slashing $5 billion from the 1954 USAF budget. In addition, the Republican administration's downward revision of the fiscal 1954 defense budget cuts the Air Force goal of 143 wings by 1955 to only 120 wings by 1956. Still another air power setback came when a Navy man, Admiral Arthur W. Radford, was named as chairman of the Joint Chiefs of Staff. Radford has championed stronger Navy carrier forces and opposed strategic bombing and the B-36 concept of air power. Radford's appoint-


# FLIGHT MAGAZINE
Including SOUTHERN FLIGHT and MODERN AIRPORTS

JUNE, 1953 VOL. 39, No. 6


**COVER:** Night stop at Keokuk, Iowa, shows a DC-3 of Ozark Air Lines — a symbol of scheduled air service to the smaller cities and towns of America. Local service airline growth is outlined in facts and figures on pages 22-56 of this issue. —(Ozark Air Lines Photo.)


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# Great Airlines from Little Airlines grow

and become GREAT assets to the commercial and military might of our Nation!

TRANS WORLD AIRLINES of Kansas City and New York is one of the finest examples of such dynamic development. For TWA began in the late twenties when the five parent companies were formed, backed only by private capital and the stern determination to render a vital new service to the Nation and its citizenry.

It was then that Harris "Pop" Hanshue, founder of Western Express, began flying mail from Los Angeles to Salt Lake City in Douglas biplanes. Others, with 'independent' airlines carrying only passengers and freight without mail pay, included Jack Frye's Standard Airlines operating one eight passenger Fokker, Los Angeles, Phoenix and Tucson, and Jack Maddux's Maddux Airlines with Ford tri-motors flying San Francisco, Los Angeles, San Diego and Tijuana. The parental foursome came into being in 1929 when Transcontinental Air Transport, the Lindberg Line, was founded. And in the same year surviving companies were merged to form Transcontinental and Western Air, with Pittsburgh Aviation Industries Corporation retaining five per cent of the stock. During those days with low-wing Northrop mail planes, TWA sped the mail across the country in 24 hours!

Today, fifty years after the famous Wright Brothers' first flight at Kitty Hawk, North Carolina, Trans World Airlines flights are 'called' virtually hourly in many of the capitals of the world—London, Lisbon, Paris, Geneva, Rome, Bombay, Tel Aviv, Bengasi and Dhahran, as well as 54 cities throughout the Nation.

Thus, on the golden anniversary of powered flight, North American Airlines, an independent carrier pioneering air coach in today's tempo, congratulates Trans World Airlines and its management for its contribution in the development and growth of the Nation's air transport industry under the American free enterprise system.

(Third in a series — FOLLOWING THE TRAILS OF THE PIONEERS)

## NORTH AMERICAN AIRLINES

First in Air Coach


ment is considered a slap at air power proponents.

**GENERAL NATHAN F. TWINING** has succeeded General Hoyt Vandenberg as U. S. Air Force chief of staff, the latter having retired. Lt. Gen. Thomas D. White has been named as vice chief.

**FIRST U. S. AIRLINE TO ADOPT AFT-FACING SEATS** is unscheduled North American Airlines, which inaugurated DC-4 aircoach service last month between California and New York via Kansas City and Chicago. With several DC-6B's on order, North American proposes a 21-city "Air Bus" service which will provide the first 3c per mile air fares in history, lower than present rail coach fares. The DC-6B's will also feature aft-facing seats.

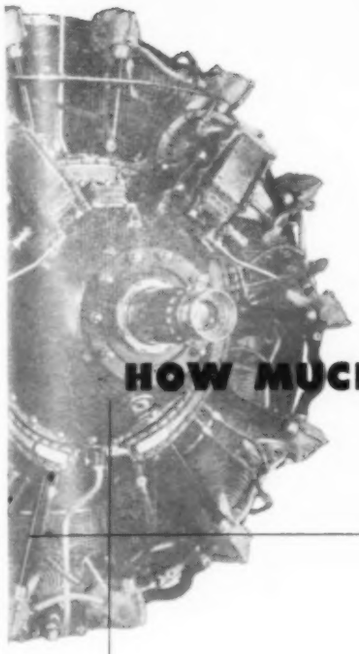
**DONALD R. McCANN,** 16-year veteran with Air Associates, Inc., has been appointed manager of the company's Dallas Branch to succeed **Robert Kenty** who was killed last month in an airline crash. **C. E. Wickline** will replace **F. E. Bryant,** also killed in the accident, as purchasing agent.

**A PROPOSED 2,350-FOOT TELEVISION TOWER** south of the new Greater Fort Worth International Airport would prove an extremely dangerous hazard to instrument operations at several airports in the Fort Worth-Dallas area, according to interested observers. Since a plot of land consisting of 100 acres would be required to handle the guy wires alone, private fliers state the tower would prove a hazard to them in VFR conditions. Hearings are scheduled soon before the air space sub-committee of the Air Coordinating Committee in Washington.

**REORGANIZATION OF THE CIVIL AERONAUTICS ADMINISTRATION** from seven regional offices to four is playing havoc with veteran CAA personnel. Many are being "busted," others transferred to new posts, some being eliminated while many are looking for jobs in industry. Several months will be required to unravel the mess. As yet there are no predictions as to how much money will be saved.

**MORE EFFICIENT JET AND ROCKET ENGINES** may result from research into "sonic gasification" in which sound waves are introduced into combustion chambers to "peel" layers from burning fuel particles. Gilbert Magill, president, and Dr. Saul Pollock, rocket combustion scientist, of Rotor-Craft Corp., of Glendale, California, discussed the research last month. Rotor-Craft is a pioneer West Coast helicopter firm engaged in a Navy rocket project. They said rocket motors "having nearly complete burning efficiency" and using low-grade fuels are within sight. This efficiency

*(Continued on page 78)*



# HOW MUCH DOES AN OVERHAUL *finally* COST?

It costs more than just the price charged by the overhaul shops. Delays in engine delivery pile up expensive ground time. Small, not quite right fits and adjustments add mechanics' time and pilot annoyance throughout the service life.

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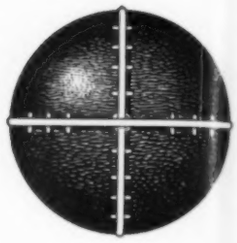

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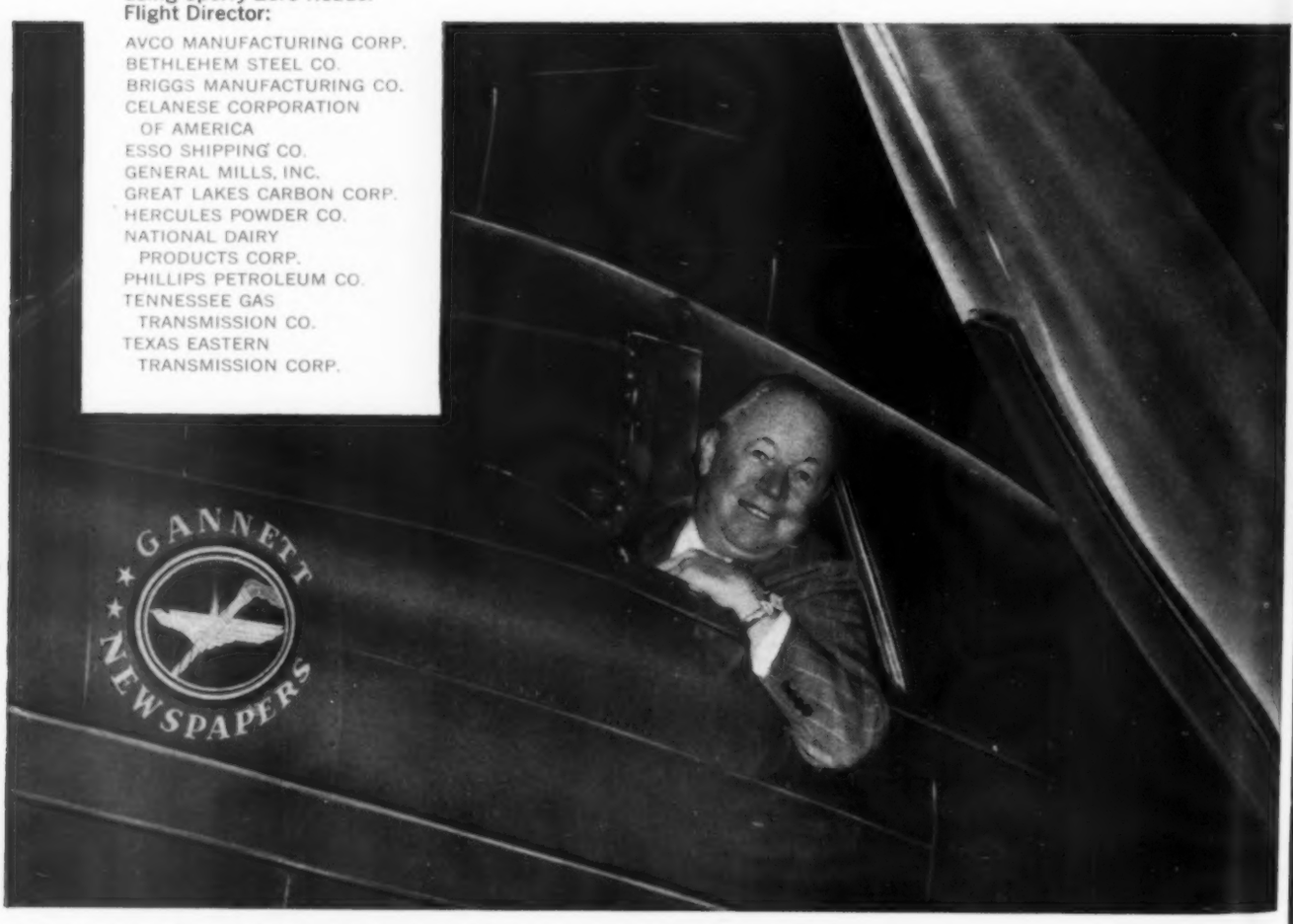


Cmdr. Russell Holderman of the Gannett Newspapers, who is celebrating his 40th year as a pilot, is one of the enthusiastic users of the Sperry Zero Reader Flight Director.

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# 25

## *Years of Overseas Service*

- first across the Pacific
- first across the North Atlantic
- first around the World

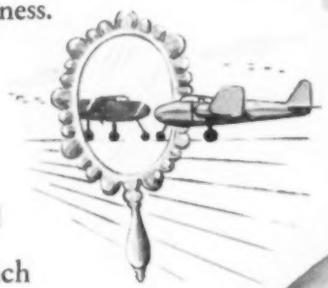
## PAN AMERICAN WORLD AIRWAYS

WORLD'S MOST EXPERIENCED AIRLINE

# Facts *and Figures!..*

### *Figure:*

Is she putting the garter on — or is she taking it off? And why the wink? Your guess is as good as ours. There's no guesswork, however, about the charms of Betsy Perrine, 27, brown hair and brown eyes, who gives the scales a treat with 120 lbs. of olive-skinned loveliness.



### *Fact:*

Something old and something new: Such a blend helps make a June bride the traditional symbol of beauty and joy. Such a blend, too, makes a Southwest Airmotive-converted executive airplane a beauty to behold and a joy forever to the pilot and owner lucky enough to possess it. This is a fact we have proved many times in giving a luxurious new touch to an old airplane. Write our Service Representative for more details.

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# Just among ourselves

EDITORIALS

## FOR ALL THE PEOPLE

FIFTEEN years ago a National Air Mail Feeder Conference was held in Kansas City, Missouri. That was the year Congress passed the Civil Aeronautics Act of 1938 which has since guided the destinies of our national air transport system.

One of the speakers at this "feeder" conference was Charlie Graddick, superintendent of the air mail service, Post Office Department. He made the following definitions:

Primary Air Transport Route — one which is of such length and importance that its schedules are set up primarily to suit the needs of the cities served on the route, rather than to connect schedules of other routes.

Secondary Air Transport Route — one which is as much dependent on connecting routes for traffic as they are on the cities they serve.

Feeder Air Mail Route — one emanating from a stop on a primary or secondary route over which would be operated types of planes capable of flying efficiently and economically at low altitudes; of operating into and out of comparatively small, reasonable-cost airports, and of making frequent stops at all cities and towns of fair size on the route.

Air Mail Star Route — the law provides for the transportation of mail by planes on five star routes over difficult terrain. The only difference between a short air mail route and a star route is that the Post Office Department dispatches all types of mail on a star route.

Experimental Route — a route officially designated as such by Congress in the law authorizing the service (operated in Pennsylvania, West Virginia and Ohio, using planes equipped to pick up and deliver mail in flight without stopping at an airport).

Coming from a postal service authority these 15-year old definitions are of considerable interest since it was the Post Office Department which laid the groundwork through early experimentation for the world's largest and most efficient air transportation system. Except for the air mail pick-up experiment, the definitions of different types of operations outlined by Mr. Graddick are just as applicable to the air service needs of the nation today as they were fifteen years ago. Why, then, has there been so little permanent accomplishment outside the realm of the major trunk airlines?

We believe the answer to that question is found in the fact that the same basic federal policy which gave us the world's finest trunk airline system has not been applied in order to provide equivalent service in the secondary and so-called "feeder" category of air transport to the smaller communities of the nation.

It is true that mounting deficits in the Post Office Department and an admirable desire for self-sufficiency of all carriers have played havoc in the use of air mail pay for subsidy purposes. It is true that the shot-gun marriage of local service carriers to the obsolete and uneconomical DC-3 has kept the cost of air service to smaller communities in an inordinately high bracket. It is true that pathetically weak management in some of the local service companies has been a deterrent to a more forthright federal policy.

But it is also true that the so-called local service experiment, in which lie the hopes of progressive Americans for air service to ALL our people, has been

*(Continued on page 44)*

## ROBERT B. KENTY

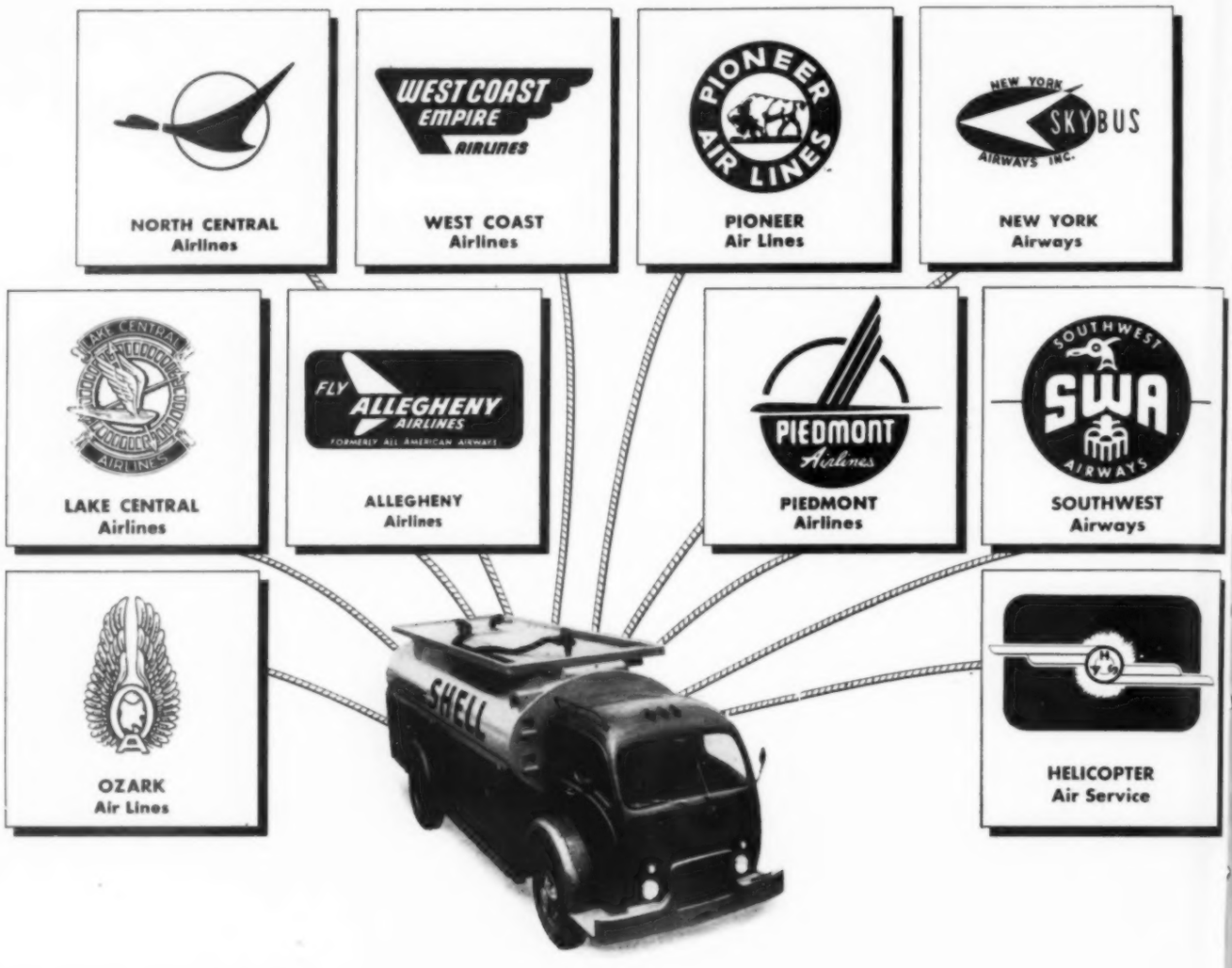
WHILE a beloved family, his business associates and hundreds of friends now mourn the untimely passing last month of Robert B. Kenty of the Air Associates Company, his loss to aviation is quite as great and incalculable. Bob was killed ironically in an airline accident near Marshall, Texas, after foregoing a trip in his own Bonanza because of bad weather.

There simply are no words capable of expressing all the human feelings of irrevocable loss when such a life as Kenty's is snuffed out before the full gamut on this earth has been run. But we would like to record one abiding hope — that this great industry will continue to produce and develop men of his caliber; his personal influence for the good things of aviation for more than two decades will be felt for many years to come.

We doubt if any other one individual in the history of aviation can match the profound influence Kenty had in bringing sound and decent merchandising principles into a field of aviation business endeavor long famous for dirty dealing, cut-throat discounts and let-the-buyer-beware philosophy. Largely through his leadership in the Aviation Distributors and Manufacturers Association, he was able to revolutionize commercial distribution of aeronautical products, bringing it up from a cats-and-dogs business to one with ethical standards as high as any industry in the nation.

Kenty will be long remembered for his efforts in raising the standards of the industry he loved. But to a smaller and more intimate group of contemporary aviation people, Bob Kenty has a permanent niche in aviation's immortal hall of fame for his generosity, his sympathy for the little guy, his forthright backing of all good causes that seem always coming up from time to time on the aviation scene. He was rarely in the foreground and received little or no public notice for his untold scores of generous and helpful assistance to constructive causes, preferring to remain quietly in the background and taking no credit.

The loss of Bob Kenty to commercial aviation is a heavy one. May the real and lasting monument to his memory be the high standards he set for himself and for the industry he loved so that all who follow might apply the magnificent principles that ruled his life. ★ ★ ★

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Shell's growth in the aviation industry and in research has paralleled the growth of air transportation.

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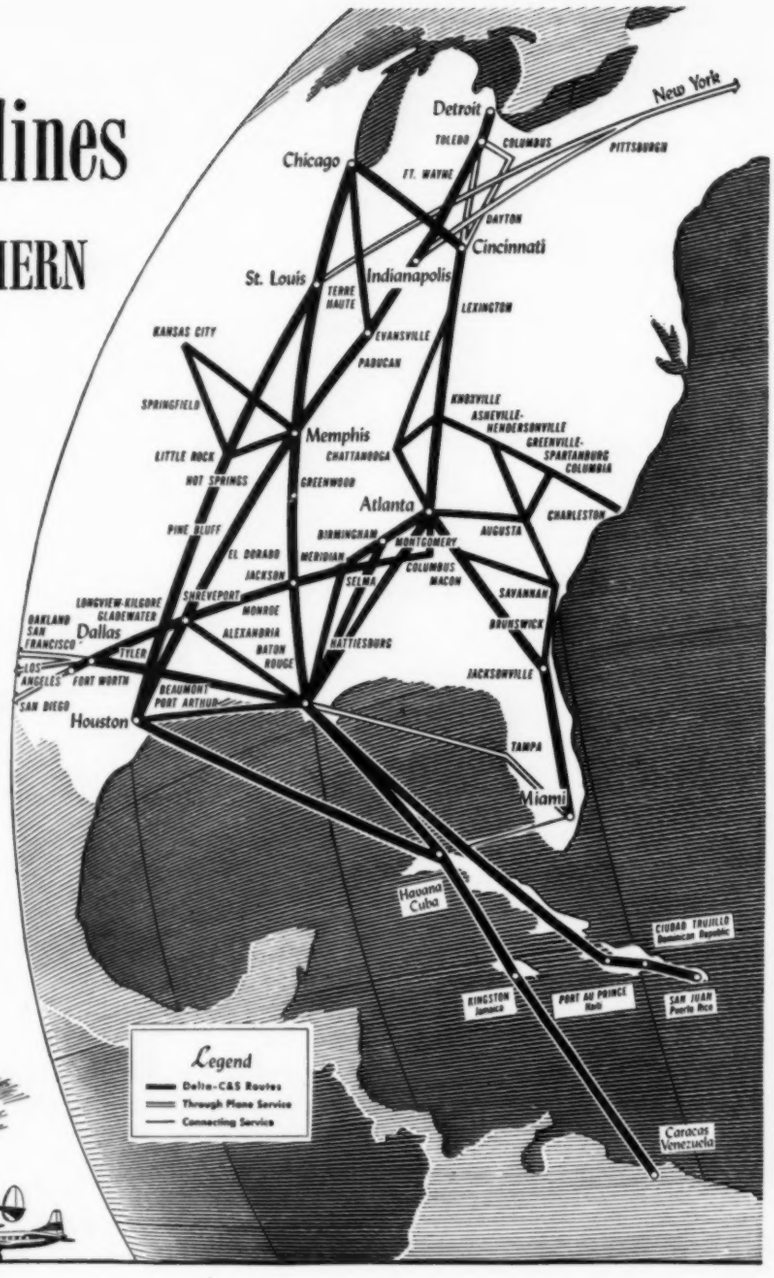
SHELL

# Two pioneer airlines

## DELTA and CHICAGO & SOUTHERN

# Merge

## to serve you better




Delta Air Lines, Inc., Operating as

**Delta-C&S AIR LINES**

Two great pioneer airlines now are one. Delta, with 24 years of experience in serving the South and linking it with the Midwest, joins with Chicago & Southern which has served the Mississippi Valley for 19 years and also ties Mid-America to the West Indies and South America.

This merger is one of top management and line personnel, as well as routes, and the public will gain from the combination of talent and facilities. Approved by the Civil Aeronautics Board and the President of the United States, it has now been ratified by the stockholders of each line. Operation as one company, Delta-C&S Air Lines, is now in effect. For the immediate present, however, flight schedules will be unaffected on both systems.

The new system now provides connections at 53 different points with local service carriers and greatly expands the scope of transportation to or from local service cities and the 61 cities on the new Delta-C&S system.

The merged airline intends to maintain the reputations earned by the two individual companies for friendly, hospitable service with modern, luxurious equipment.

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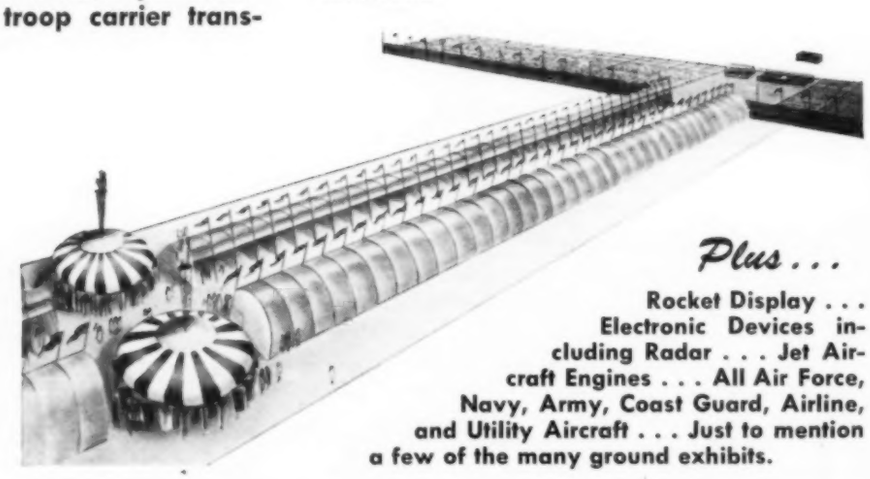

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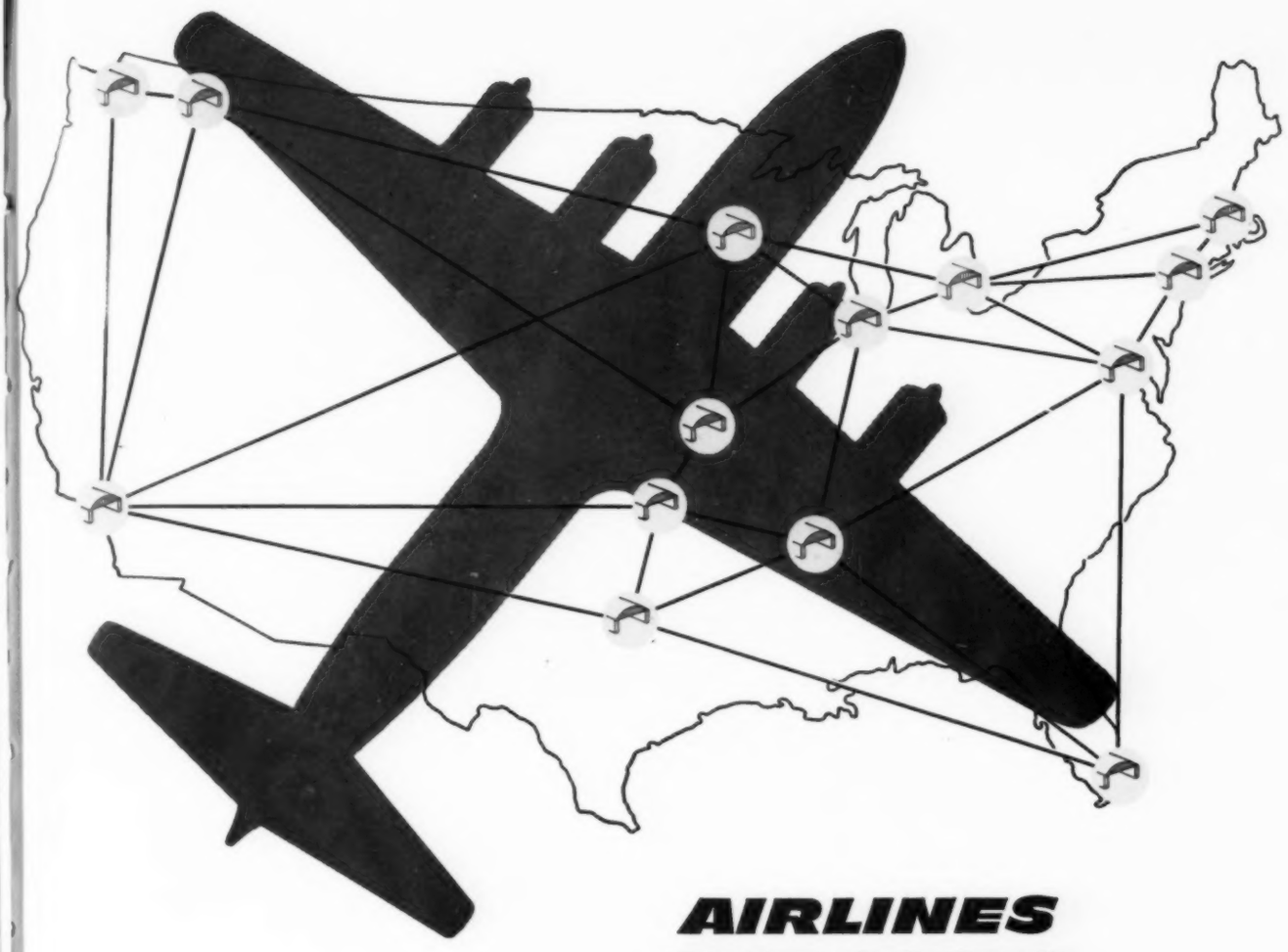

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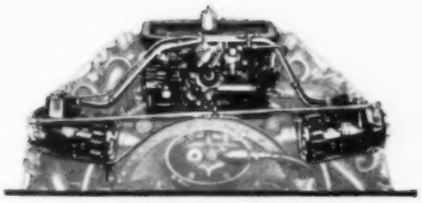

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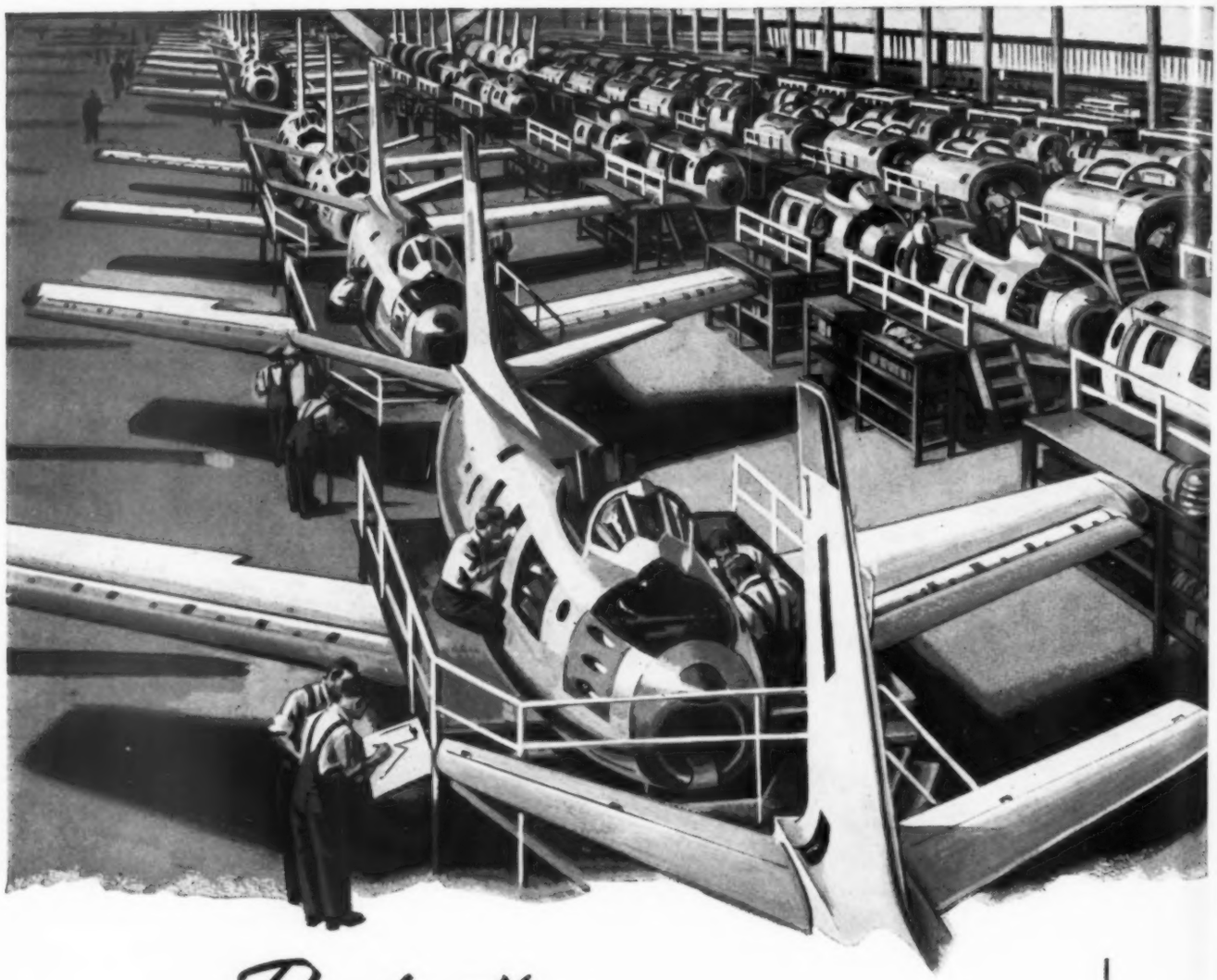

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# Our Hat is Off to
# LOCAL SERVICE CARRIERS

**American Airlines proudly salutes the local service airlines and congratulates them on another year of growth and progress.**

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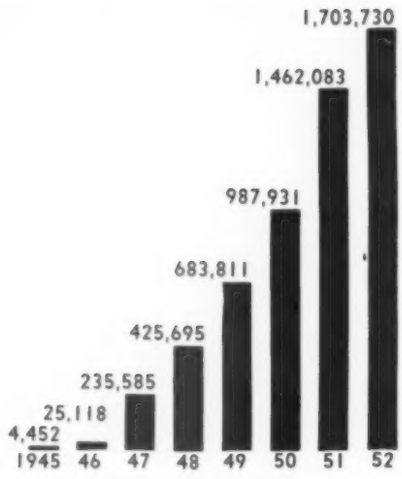
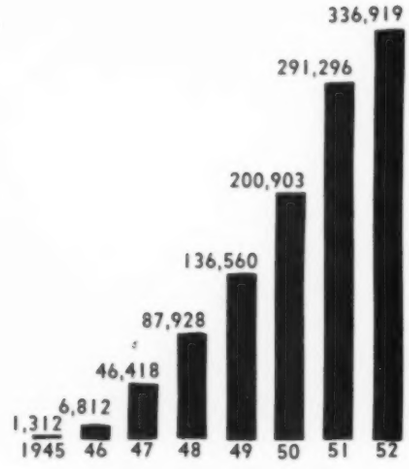
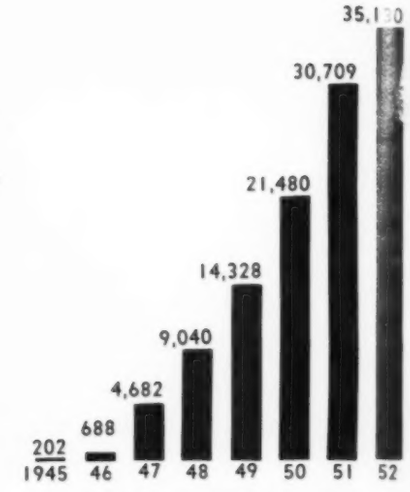


Local Service Passengers



Revenue Passenger Miles



Total Revenue Ton-Miles (000)

# Local Air Service Progress

## An appraisal of the steady growth of our secondary airline system

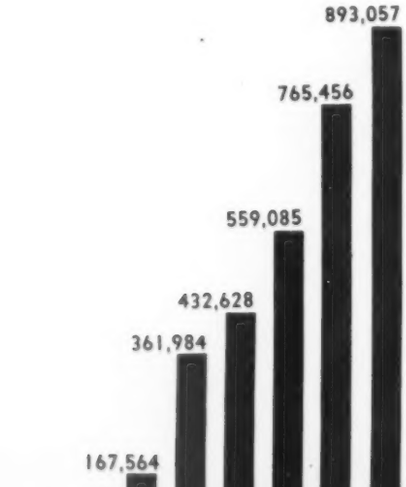
By GEORGE E. HADDAWAY

SUBSIDY is a horrid word, especially at the moment. It was not always thus. From the days of the pony express through the eras of rail, water and highway transportation development this nation has always invested money of a subsidy nature in order to create rapid transportation and communications. No other national investment has paid off more fruitfully than those made in the realm of all forms of transport.

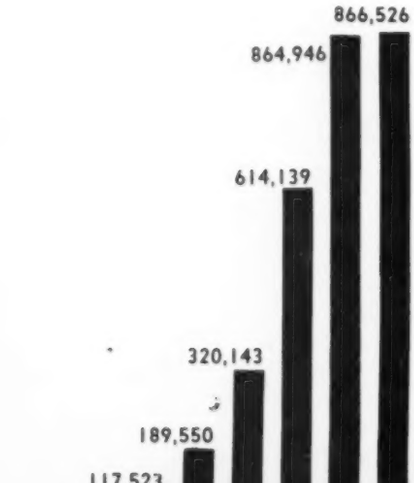
Perhaps the epitome of rapid return on investment may be found in the history of trunk airline development; for that area of transportation is now self-sufficient and the total investment of national funds a mere pittance when compared to the hundreds of millions that went into rail, ground and water transportation.

But the trunk airlines do not serve all the people—they fly between the larger communities. They are but one-half of an air transportation system. The other half, encompassed within the framework of 14 temporarily-certificated local service airlines, is now in the formative stage, comparable to the difficult years of the trunk airlines in the 1930's.

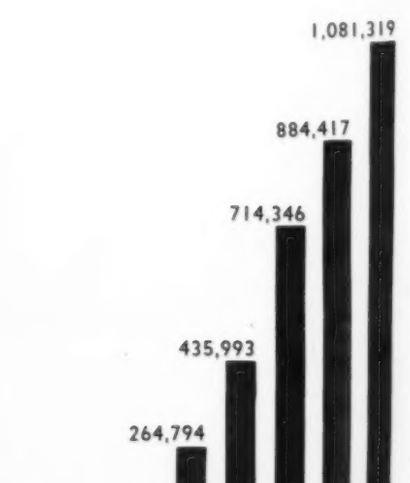
Local service airlines—our secondary air transportation system—are less than eight years old. Most of the carriers boast less than five years of operations. Their rapidity of growth, measured by public patronage, far exceeds the rate of growth of our trunk systems. Yet today there are strong indications that the century-old formula of developing transportation in this nation may be scuttled, all under the hollow guise of "economy."



Air Mail Ton-Miles



Express Ton-Miles



Freight Ton-Miles

## Local Service Airlines Traffic, 1945-1952

| Year | Revenue Passengers | Revenue Passenger Miles (000) | Passenger Load Factor | Air Mail Ton-Miles | Express Ton-Miles | Freight Ton-Miles | Total Rev. Ton-Miles (000) |
|---|---|---|---|---|---|---|---|
| 1945 | 4,452 | 1,312 | 52.78 | 74,510 | 11,482 | .... | 202 |
| 1946 | 25,118 | 6,812 | 37.92 | 60,088 | 24,354 | 25 | 688 |
| 1947 | 235,585 | 46,418 | 29.85 | 167,564 | 117,523 | 62,039 | 4,682 |
| 1948 | 425,695 | 87,928 | 27.14 | 361,984 | 189,550 | 264,794 | 9,040 |
| 1949 | 683,811 | 136,560 | 28.47 | 432,628 | 320,143 | 435,993 | 14,328 |
| 1950 | 987,931 | 200,903 | 33.07 | 559,085 | 614,139 | 714,346 | 21,480 |
| 1951 | 1,462,083 | 291,296 | 38.20 | 765,456 | 864,946 | 884,417 | 30,709 |
| 1952 | 1,703,730 | 336,919 | 38.64 | 893,057 | 866,526 | 1,081,319 | 35,130 |

It is at present an ominous cloud hanging threateningly over the hardy workers pioneering in the field of bringing air transportation to our smaller communities. Whether the cloud brings a deluge of destruction and ruin or will be dissipated by enlightened federal policy remains to be seen. No one will deny that the clouds are gathering, however. The separation of subsidy payments from mail pay will not affect the self-sufficient trunks. It could, however, wreak havoc with the local service air transportation system at this stage of development when annual subsidy payments average around $20 million.

There is one other major cloud hanging over the local service carriers. They are chained like a slave to the old obsolete war-horse, the DC-3 transport, which is becoming more expensive to operate and less attractive to airline passengers. Here again federal air policy will determine if and when emancipation from the DC-3 will ever come. With temporary certificates, which are not attractive to investment capital, it is impossible for the carriers to band together and develop with their own funds a short-haul transport suited to their route structures and peculiar operating requirements. They are rapidly approaching the point of diminishing returns with the DC-3. Maintenance costs are rising, surplus parts are becoming scarce. The day is not far off when lack of a suitable replacement airplane will torpedo the entire concept of local service air transportation; for there can never be self-sufficiency for the locals without an efficient transport designed for their needs. The longer the day of reckoning is postponed, the greater the subsidy or "break-even" requirements will be. It is indeed a vicious circle. Only Uncle Sam can break it.

Until last year the local service carriers were showing a definite trend toward ultimate self-sufficiency, even with the DC-3. But this trend was slowed in 1952. The terrific rise in operating costs accompanied by relatively small increases in non-mail traffic produced an increase of nearly 10 cents per mile in mail pay required to break even. Added to the mounting costs of maintaining the DC-3 fleet was the action which forced the local service carriers to pay their flight crews according to the trunkline scales. With unionized employes getting a big boost in pay, the carriers in turn had to increase salaries and wages all down the line.

A third factor in skyrocketing costs was new and added route mileage granted the carriers during certificate renewal cases. The costs that go with inaugurating service over new routes are reflected in the total 1952 increased costs of operations. All new route mileage suffers low load factors until traffic has time to develop. A cursory glance at the statistical information in this issue will reveal that new route mileage is partly responsible for 1952 showing the least growth in load factor figures and in non-mail revenue per mile.

The Newark, New Jersey, airport situation early in 1952 worked against the local carriers' 1952 figures, principally Allegheny and Mohawk, which lost heavily by having to move to Idlewild airport, far removed from the doorsteps of their major customers. It was substantial enough to affect the over-all traffic figures for all the carriers.

But not all was dark in 1952 as

*(Continued on page 48)*

## Local Service Airlines

**Average No. and Type of Aircraft Used in Scheduled Service Fourth Quarter 1952**

| Carrier | | |
|---|---|---|
| All American | 12 | Douglas DC-3 |
| Bonanza | 4 | Douglas DC-3 |
| Central | 6 | Douglas DC-3 |
| Frontier | 12 | Douglas DC-3 |
| Lake Central | 4 | Douglas DC-3 |
| Mohawk | 8 | Douglas DC-3 |
| Ozark | 8 | Douglas DC-3 |
| Piedmont | 13 | Douglas DC-3 |
| Pioneer | 9 | Martin 202 |
| Southern | 9 | Douglas DC-3 |
| Southwest | 9 | Douglas DC-3 |
| Trans-Texas | 10 | Douglas DC-3 |
| West Coast | 11 | Douglas DC-3 |
| Wiggins | 5 | Cessna T-50 |
| Wisconsin Central | 10 | Douglas DC-3 |
| Total | 130 | |

## Local Service Airlines Route Pattern Data

**As of December, 1952**

| Carrier | Population Served | No. of Stops | Local Service Only Population Served | Local Service Only No. of Stops | Undup. Route Mi. Operated | Avg. Pop. Per Stop System | Avg. Pop. Per Stop Local Svc. Only Stops | Per Cent of System Local Service Only Pop. | Per Cent of System Local Service Only No. of Stops | No. of Segments | Avg. Length of Segment | Pop. Per Route Mile |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All American | 15,170,471 | 31 | 524,764 | 15 | 2,062 | 489,370 | 34,980 | 3.46 | 48 | 37 | 55.7 | 7,357 |
| Bonanza | 2,569,183 | 15 | 100,499 | 10 | 1,309 | 171,279 | 10,050 | 3.91 | 67 | 15 | 87.3 | 1,963 |
| Central | 1,700,016 | 22 | 218,630 | 12 | 1,198 | 77,273 | 18,219 | 12.86 | 55 | 22 | 54.5 | 1,419 |
| Frontier | 1,329,163 | 37 | 147,814 | 22 | 3,550 | 35,923 | 6,719 | 11.12 | 59 | 41 | 86.6 | 374 |
| Lake Central | 5,413,334 | 11 | 141,942 | 4 | 632 | 492,121 | 35,486 | 2.62 | 36 | 10 | 63.2 | 8,565 |
| Mohawk | 10,106,684 | 10 | 172,420 | 2 | 1,019 | 1,010,668 | 86,235 | 1.71 | 20 | 13 | 78.4 | 9,918 |
| Ozark | 7,021,354 | 28 | 374,352 | 11 | 1,858 | 250,763 | 34,032 | 5.33 | 39 | 28 | 66.4 | 3,779 |
| Piedmont | 2,662,679 | 25 | 259,305 | 7 | 2,197 | 106,507 | 37,044 | 9.74 | 28 | 30 | 73.2 | 1,212 |
| Pioneer | 2,076,226 | 20 | 175,551 | 9 | 1,932 | 103,811 | 19,506 | 8.46 | 45 | 23 | 84.0 | 1,075 |
| Southern | 3,157,656 | 32 | 331,671 | 13 | 2,134 | 98,677 | 25,513 | 10.50 | 41 | 32 | 66.7 | 1,480 |
| Southwest | 3,712,761 | 26 | 427,564 | 21 | 1,153 | 142,799 | 20,360 | 11.52 | 81 | 26 | 44.3 | 3,220 |
| Trans-Texas | 2,104,069 | 26 | 210,655 | 15 | 2,141 | 80,926 | 14,044 | 10.01 | 58 | 28 | 76.5 | 983 |
| West Coast | 1,484,774 | 31 | 291,339 | 19 | 2,156 | 47,896 | 15,334 | 19.62 | 61 | 35 | 61.6 | 689 |
| Wiggins | 2,262,195 | 15 | 223,326 | 7 | 841 | 150,813 | 31,904 | 9.87 | 47 | 19 | 44.3 | 2,690 |
| Wisconsin-Central | 5,906,514 | 28 | 639,075 | 22 | 2,250 | 210,947 | 29,049 | 10.82 | 79 | 32 | 70.3 | 2,625 |
| Undup. Total | 43,375,460 | 330 | 4,232,143 | 188 | 26,245 | 131,441 | 22,511 | 9.76 | 57 | 393 | 66.8 | 1,653 |
| Undup. Total, 1951 | 43,597,890 | 338 | 3,782,362 | 183 | 24,991 | 128,988 | 20,669 | 8.68 | 54 | 381 | 65.6 | 1,745 |

NOTE: All American is now Allegheny and Wisconsin-Central is now North Central.

Prepared by Ray and Ray.

**Interline Passenger Revenue in Dollars — Revenue to Trunks from Passengers Exchanged with Local Carriers* — Year 1952†**

| Carriers | American | Braniff | Capital | C & S | Colonial | Continental | Delta | Eastern | Mid-Continent | National | Northeast | Northwest | TWA | United | Western-Inland | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allegheny | 380,690 | 12,824 | 309,247 | 4,365 | 15,944 | 4,440 | 21,808 | 190,844 | 1,672 | 49,994 | 17,300 | 177,704 | 666,309 | 181,525 | ..... | 2,034,666 |
| Bonanza | 233,507 | 8,685 | 3,721 | 1,823 | 131 | 12,137 | 24,316 | 3,183 | 987 | 5,841 | 145 | 1,091 | 143,500 | 63,213 | 75,985 | 578,265 |
| Central | 158,425 | 83,938 | 2,467 | 4,410 | 410 | 46,179 | 39,678 | 13,794 | 21,504 | 1,669 | 432 | 2,014 | 116,136 | 21,641 | 4,488 | 517,155 |
| Frontier | 175,107 | 100,716 | 3,637 | 847 | 131 | 145,764 | 21,105 | 12,509 | 4,078 | 1,805 | 723 | 48,002 | 184,254 | 361,220 | 116,483 | 1,176,381 |
| Lake Central | 79,213 | 4,163 | 8,333 | 24,073 | | 1,875 | 11,490 | 52,591 | 167 | 51 | 427 | 28,041 | 93,360 | 44,765 | 1,506 | 350,055 |
| Mohawk | 283,093 | 3,793 | 18,983 | 4,648 | 20,061 | 1,691 | 196 | 114,273 | 444 | 30,884 | 8,437 | 59,418 | 69,967 | 106,661 | 3,460 | 706,045 |
| North Central | 490,047 | 133,116 | 248,685 | 92,845 | 1,385 | 5,498 | 114,707 | 149,260 | 34,766 | 2,788 | 6,307 | 388,375 | 295,738 | 322,682 | 19,734 | 2,305,932 |
| Ozark | 307,773 | 70,240 | 59,019 | 77,328 | | 22,388 | 8,213 | 81,881 | ‡ | 1,775 | 1,003 | 44,803 | 28,530 | 188,285 | 2,351 | 893,589 |
| Piedmont | 377,157 | 12,092 | 127,139 | 6,141 | 7,825 | 10,551 | 342,634 | 608,812 | 2,931 | 61,358 | 3,326 | 120,561 | 323,153 | 375,834 | 3,169 | 2,382,683 |
| Pioneer | 1,109,586 | 354,547 | 20,310 | 42,282 | 1,247 | 80,762 | 234,459 | 468,440 | 9,912 | 31,792 | 1,424 | 8,950 | 146,378 | 63,007 | 17,809 | 2,590,905 |
| Southern | 283,466 | 25,974 | 168,007 | 176,003 | 3,104 | 4,717 | 281,618 | 560,299 | 6,033 | 31,847 | 1,788 | 39,843 | 22,261 | 59,708 | 1,194 | 1,665,862 |
| Southwest | 850,231 | 10,139 | 20,019 | 2,985 | 1,217 | 15,790 | 72,842 | 17,537 | 4,706 | 5,086 | 3,298 | 40,011 | 781,000 | 697,768 | 166,600 | 2,689,229 |
| Trans-Texas | 461,232 | 255,811 | 10,356 | 149,821 | 478 | 74,369 | 34,125 | 186,688 | 16,849 | 14,518 | 52 | 3,392 | 13,666 | 32,966 | 5,499 | 1,259,822 |
| West Coast | | | | | | Data Not Available | | | | | | | | | | |
| Total | 5,189,527 | 1,0[illegible]5,038 | 999,923 | 587,591 | 51,933 | 426,111 | 1,207,191 | 2,460,111 | 104,049 | 239,408 | 44,698 | 962,205 | 2,884,252 | 2,519,275 | 418,278 | 19,150,590 |

*It is assumed that passengers going from a trunk to a local fly the same fare on the trunk before deplaning as the passengers from the local pay on the trunk. †Actual survey was for 3rd quarter, 1952 which was then adjusted for seasonality for each carrier and projected to a full year. ‡Included with Braniff.

—From a Study by Ray and Ray.

# Feeder Pay-off to Trunks

## Over $19,000,000 in passenger revenues were fed to trunk lines in 1952 by local carriers

As a result of a study just completed for the local service airlines by Ray & Ray, some interesting details of the interchange of passengers between local service and trunk carriers have become available. Of foremost import is the fact that 54.4 per cent of all passenger revenues of the local service airlines comes from passengers who are flying on the local service carrier as part of a journey that began or will terminate on a trunk carrier. Thus over one-half of all local service passenger revenues are from passengers interlined with trunk airlines.

While being such a vital part of the business of the local service airlines, these same passengers account for only 3 per cent of the passenger traffic revenue of the trunk lines. Yet this small 3 per cent is still a very essential part of the trunk-line financial picture, for it is equivalent to 53 per cent of the total mail pay that the trunk lines received in 1952.

Based on a three-month survey, the figures indicate that for the year 1952 the local service airlines carried 766,210 passengers that were interlined with trunk carriers. This figure does not include the traffic of West Coast-Empire, Mid-West, or Wiggins, but represents 49.2 per cent of the total traffic carried by the rest of the local service airlines represented in the survey. Because the average fare paid the local service airlines by these interlined passengers is slightly higher than the over-all average fare of all local service passengers ($11.63 to $11.37), the revenue represented by these interlined passengers is 54.5 per cent of the total passenger revenues of the local service airlines.

### Trunk Take Largest

For the airlines included in the survey, the trunk-line portion of the combined interline fare was $24.99, or 68 per cent of the total, while the local service carriers received $11.63, or 32 per cent. This represented a total of $19,150,590 to the trunk lines and $8,909,599 to the local service lines. By coincidence, the trunk-line portion of $19,150,590 is almost equal to the *total* passenger revenues of $19,171,798 of *all* of the local service carriers for 1952.

**NUMBER OF INTERLINE PASSENGERS**
**Exchanged Between Local and Trunk Airlines**
**Passengers Interchanged**
**1952**

| | From Locals To Trunks | From Trunks To Locals | Total | % of Total Passenger Traffic Carried |
|---|---|---|---|---|
| Allegheny | 34,453 | 68,021 | 102,474 | 55.7 |
| Bonanza | 8,353 | 13,666 | 22,019 | 50.4 |
| Central | 8,909 | 15,347 | 24,256 | 51.4 |
| Frontier | 18,421 | 27,545 | 45,966 | 36.1 |
| Lake Cent. | 7,584 | 9,424 | 17,008 | 51.2 |
| Mohawk | 12,733 | 10,162 | 22,895 | 20.7 |
| North Cent. | 34,866 | 64,045 | 98,911 | 64.6 |
| Ozark | 18,763 | 33,160 | 51,923 | 61.5 |
| Piedmont | 51,444 | 61,499 | 112,943 | 50.2 |
| Pioneer | 38,026 | 48,338 | 86,364 | 47.1 |
| Southern | 30,141 | 44,478 | 74,618 | 60.6 |
| Southwest | 26,363 | 40,708 | 67,071 | 40.7 |
| Trans-Texas | 19,342 | 20,419 | 39,761 | 50.0 |
| West Coast | Data Not Available | | | |
| Total | 309,398 | 456,812 | 766,210 | 49.2 |

—From a Study by Ray and Ray.

In addition to this contribution added to traffic revenues for the trunk lines in part made possible through extension of airline service to 188 cities not otherwise served and almost equivalent in amount to the total amount of mail pay paid to all of the local service airlines, there is still more trunk-line revenue from passengers who travel from the cities served exclusively by the local carriers but who, because of schedule timing, travel by surface means to the nearest trunk-line connecting point. Many of these passengers are the result of sales effort on the part of the local service airlines, and, in addition, may have been rendered the service of making reservations and being ticketed on the trunk line by the local service carrier in their community who gained not a penny in revenue from this service.

That the increase in amount of interline traffic by the local service carriers is a development of the last two years can readily be understood when it is realized that three years ago the airlines campaigned to be known as "local service airlines" rather than "feeder airlines" as they were then known. The basis was that, contrary to the beliefs of the airlines and the

**Number of Interline Passengers Fed to the Trunks by the Local Carriers — Year 1952**

| | American | Braniff | Capital | C & S | Colonial | Continental | Delta | Eastern | Mid-Continent | National | Northeast | Northwest | TWA | United | Western-Inland | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Allegheny | 6,415 | 198 | 9,545 | 118 | 570 | 105 | 570 | 3,502 | 56 | 687 | 511 | 1,485 | 9,105 | 1,616 | 0 | 34,453 |
| Bonanza | 2,882 | 221 | 83 | 17 | 3 | 204 | 352 | 72 | 28 | 104 | 7 | 24 | 1,250 | 1,560 | 1,546 | 8,353 |
| Central | 2,096 | 2,122 | 83 | 50 | 14 | 921 | 615 | 478 | 432 | 36 | 18 | 22 | 1,500 | 432 | 90 | 8,909 |
| Frontier | 3,282 | 1,264 | 134 | 28 | 7 | 2,635 | 258 | 196 | 96 | 48 | 31 | 637 | 2,797 | 4,680 | 2,328 | 18,421 |
| Lake Central | 1,839 | 69 | 348 | 720 | 0 | 36 | 264 | 1,734 | 7 | 4 | 18 | 304 | 1,575 | 630 | 36 | 7,584 |
| Mohawk | 5,954 | 0 | 447 | 0 | 539 | 0 | 0 | 2,507 | 0 | 574 | 118 | 189 | 1,844 | 561 | 0 | 12,733 |
| North Central | 6,437 | 1,926 | 5,323 | 1,655 | 48 | 140 | 1,962 | 2,910 | 737 | 116 | 226 | 6,678 | 3,112 | 3,290 | 306 | 34,866 |
| Ozark | 5,251 | 1,467 | 1,392 | 1,724 | 0 | 478 | 180 | 1,596 | * | 41 | 34 | 603 | 3,778 | 2,155 | 64 | 18,763 |
| Piedmont | 8,605 | 327 | 4,107 | 269 | 228 | 242 | 9,730 | 16,556 | 82 | 1,769 | 99 | 1,053 | 5,930 | 2,362 | 75 | 51,444 |
| Pioneer | 12,537 | 7,076 | 654 | 735 | 42 | 2,256 | 3,852 | 6,522 | 239 | 639 | 35 | 158 | 2,101 | 820 | 350 | 38,026 |
| Southern | 3,583 | 567 | 2,750 | 4,131 | 110 | 80 | 5,949 | 10,450 | 152 | 951 | 61 | 388 | 517 | 422 | 30 | 30,141 |
| Southwest | 5,508 | 275 | 598 | 41 | 58 | 299 | 938 | 340 | 99 | 95 | 68 | 500 | 4,587 | 8,816 | 4,141 | 26,363 |
| Trans-Texas | 5,036 | 5,634 | 198 | 1,838 | 15 | 1,188 | 800 | 3,142 | 318 | 385 | 4 | 56 | 291 | 362 | 75 | 19,342 |
| West Coast | Data Not Available | | | | | | | | | | | | | | | |
| Total | 69,425 | 21,146 | 25,662 | 11,326 | 1,634 | 8,594 | 25,470 | 50,005 | 2,246 | 5,449 | 1,230 | 12,077 | 38,387 | 27,706 | 9,041 | 309,398 |

*Incl. with Braniff.

—From a Study by Ray and Ray.

Civil Aeronautics Board at the time of awarding original certificates, the bulk of their business was *non-interline* in nature, being composed of travelers from the smaller cities to the larger trade centers as local traffic, with only a relatively minor percentage being connecting traffic with the trunk airlines.

What has caused this remarkable upheaval in the relative amount of local and interline traffic? Speculation would indicate that the local service carriers are beginning to indoctrinate the populace of the smaller communities with the urge to use air travel, and most of these new air travelers are covering distances greater than the area covered by a single local service airline. Another obvious factor would probably be the improved relations and cooperation between the local service carriers and the trunk airlines. This has resulted in close coordination of scheduling between carriers aimed at developing interline traffic. It has also been featured by jointly sponsored advertising, promotional efforts, and inclusion in printed timetables of both carriers of available connecting services.

Some local service airlines have established interline departments headed by experienced traffic personnel whose job is to continually maintain contact

**INTERLINE PASSENGER REVENUE**
**1952**

| | Total Exchanged Revenue | Percent Distribution Interline of Total Revenue From Locals To Trunks | From Trunks To Locals | Total Interline |
|---|---|---|---|---|
| Allegheny | $ 1,573,550 | 38.2 | 20.9 | 59.1 |
| Bonanza | 476,910 | 32.1 | 20.8 | 52.9 |
| Central | 334,768 | 41.6 | 12.2 | 53.8 |
| Frontier | 1,048,426 | 25.6 | 20.0 | 45.6 |
| Lake Central | 259,753 | 37.2 | 18.0 | 55.2 |
| Mohawk | 682,834 | 23.9 | 21.1 | 45.0 |
| North Cent. | 1,743,223 | 43.9 | 22.5 | 66.4 |
| Ozark | 889,998 | 41.7 | 22.8 | 64.5 |
| Piedmont | 2,106,199 | 27.8 | 21.4 | 49.2 |
| Pioneer | 2,021,741 | 31.3 | 17.5 | 48.8 |
| Southern | 1,254,866 | 41.3 | 20.9 | 62.2 |
| Southwest | 1,741,779 | 43.8 | 12.9 | 56.7 |
| Trans-Texas | 891,324 | 39.0 | 16.5 | 56.3 |
| West Coast | Data Not Available. | | | |
| Total | $15,025,314 | 35.2 | 19.3 | 54.5 |

—From a Study by Ray and Ray.

## AIR TAXI — New Source of Feeder Revenue

THE nation's local service carriers, like the major trunk airlines, are learning that air taxi operators are a vital link in the domestic air transportation system. Air taxi not only is producing business for the local airlines but is also providing fast, safe and efficient air service to off-line points for deplaning passengers, thereby removing at least a portion of the recognized competition from automobiles.

Although the National Air Taxi Conference is relatively new and still in the growing stage of feeling their way, some 92 alert air taxi operators have signed up with the Conference and have adopted the high standards required. The airlines are showing more and more interest in air taxi.

Perhaps the most energetic of the "grandfather" airlines in stimulating air taxi sales is Northeast Airlines, which serves the New England area. Northeast is selling the idea that it's easy to get anywhere in New England — start out on Northeast and get to your destination by air taxi, ground taxi or U-Drive. They advertise air taxi, boom it in posters, folders and timetables.

Largely through Northeast's efforts the Air Taxi Conference abandoned the plane-mile basis of quoting fares and adopted a zone fare system which will certainly simplify figuring fares if the CAB approves it. The schedule is $15 per plane for a 25-mile radius, $20 for a 50-mile radius, $30 for a 75-mile radius, with a $10 increase for each 25-mile zone. The per-passenger charge therefore depends upon the number of passengers carried.

Northeast also has used air taxi extensively in backing up its own service. In order to get stand-bys out during peak seasons they have them come out to the field. If there's space due to no-shows the airline carries a 100% load factor. If not they put them on air taxi and get them to their destination. It's paying dividends.

Last year during Northeast's peak tourist season — from middle July to middle September — they carried a total of 2,000 passengers on air taxi. Such figures prove that the potential is worth spending time, money and promotional effort on.

One of the major problems is insurance. National Air Taxi Conference members carry $40,000 liability insurance on each passenger. Now and then an air taxi operator finds himself out of equipment and calls in equipment from non-conference members who do not satisfy the minimum insurance requirements. That brings in the problem of contingent liability. However, NATC members and the Air Transport Association's Air Traffic Conference believe that air taxi operations can be tightened up and strengthened by enforcement of NATC regulations. NATC intends to keep their requirements and standards so high there will be little or no chance of marginal operators of marginal equipment creeping in. As an affiliate of the National Aviation Trades Association, NATC is confident that it can in time, accomplish as much for its members as the Air Traffic Conference of the Air Transport Association has for theirs.

The whole point is this: Every air passenger's flight should begin and end right at his own doorstep — fly all the way. Continued cooperation between the air taxi people and the scheduled airlines alone can make this ideal situation possible and bring profit to all. The only trouble now is that not enough people know about air taxi. ★ ★ ★

with the trunk airlines through reservation and ticketing personnel at cities beyond the reach of local service carrier, but cities which have a strong community of interest with the smaller cities served by the local service carrier.

Central Airlines, for example, has an interline department headed by ex-American Airlines traffic man, Emmet (Zeke) Evans. Evans is a constant visitor to the sales, reservations and ticket offices of the trunk airlines at points as far removed from Central's system as Houston, San Antonio, Denver, Chicago, or Memphis. By so doing, and backing his visits with direct mail campaigns to the personnel in these and other cities, Central keeps the personnel of Braniff, American, TWA, Delta and other airlines informed of the services that Central renders in conjunction with the trunks to provide through air travel to cities not served by these trunks directly.

Braniff Airways and Central Airlines carry each other's timetables in the pockets of the seats in their airplanes. Joint promotional campaigns in the smaller cities, initiated by the local carriers and aided by trunk airline sales and flight personnel appearances have done much to develop the high degree of interline traffic.

For example, Central Airlines sponsored an air travel week in Enid, Oklahoma. Stewardesses and sales personnel from Braniff and TWA made public appearances in Enid that week at civic club lunches, department store travel fashion shows, theatre programs and the like. The end result was to acquaint Enid citizens with the availability at their airport of airline service to the world at large. An equally important result was the knowledge carried away by the trunk line personnel that Enid, Oklahoma, can be served by their airline in conjunction with Central Airlines. Central thus has educated personnel on the trunk lines to be ready to sell air service to Enid on the slightest provocation.

Such mutual cooperation between the trunks and locals was noticeably lacking when the first local service airline edition of FLIGHT MAGAZINE was published just three years ago. Today it is the rule, instead of the exception. And the result can be graphically seen in the figures: Interchanged traffic between trunk and local airlines is now 3 per cent of the trunk's passenger revenues totaling over half as much as their mail pay. The more than $19 million that represents the trunks' share of the interline traffic is close to the more than $21 million paid to the local service airlines as service mail pay *and subsidy*.

Continued efforts in the direction of increased interline traffic may continue to increase the proportionate share of interline to total local service traffic. If it does then still more justification for the continued existence and expansion of the local service airline industry will be recognized. ★★★

# Local Service Story in Movie

**Tentatively titled "Wings Over Dexter," a 30-minute educational movie on local service airlines is being produced by American Airlines, which has been active in supporting local air service. The film required a Douglas DC-3, work-horse of the locals. But American hasn't had a DC-3 since 1949. One of the locals, Mohawk Airlines, furnished one which had just run out of hours and was ready for overhaul. Old-timers at AA found it was a former AA ship, old 018—the 19th DC-3 built and one of AA's first day planes. Logs showed it had over 48,000 hours in service. Because the film will be shown in all local service regions, a mythical airline name was cooked up—"Eagle Airlines." The paint job is shown below in process. The film is also about a couple of fictional towns—"Dexter," which is Watertown, N. Y., and "Justin," which is Buffalo. Community acceptance of the local airline and the growing interdependence between community and carrier make the film story realistic. It is being shot through the eyes of a small-city newspaper editor, who recounts the beginning of the small airline and how it became a vital part of the city's life. The movie will probably be ready for viewing in July. Local airlines will probably shoot their own trailers to give the film local identification when it is shown.**

This maintenance scene was photographed at its hangar in Denver by Frontier Airlines and shows servicing of a Pratt & Whitney engine on one of Frontier's Douglas DC-3's. War-surplus engine parts have skyrocketed 300 per cent since 1950. Still higher prices can be expected in view of the diminishing supply of these parts.

# Higher Maintenance Costs

MORE than ever before, America's local service airlines are feeling the pressure from skyrocketing aircraft equipment costs. Engine parts alone have zoomed more than 300 per cent since 1950 and the end is not in sight, since the supply of war-surplus parts is shrinking steadily while the demand increases.

Other local service airline costs are climbing faster than passenger revenues. While one small airline estimates it will have to add 2,000 passengers this year to offset rising costs for engine parts alone, it must sell 4,000 additional passenger fares to balance higher payroll costs — although it doesn't have as many employes as it did two years ago.

### How It Adds Up

When the cost of one master rod shoots up from $75 to $225 in one year, the problem of higher maintenance expenses becomes apparent. At the same time, the payroll has increased 33 per cent, rising from $165,274.43 per month in September, 1950, to $211,422.78 per month late in 1942 for one local carrier. The critical problem is the fact that for every $11 its costs increase, this carrier must find another revenue passenger to meet the higher cost.

Frontier Airlines, one of the nation's largest local service carriers, has made a study of what has happened in the past few years. In 1950 a company could buy a Pratt & Whitney engine cylinder for $17.50. In 1953 the cost has increased to $60. This would not be a serious problem except for the fact that the carriers use lots

*(Continued on page 55)*

### Rising Costs for Local Service Carriers
(FROM FRONTIER AIRLINES STUDY)

| Date | Employe Group | Number Employes | Monthly Payroll | Av. Monthly Pay | Increase |
|---|---|---|---|---|---|
| Sept. 30, 1950 | Company | 568 | $165,274.43 | $292 | |
| Dec. 31, 1952 | Company | 545 | $211,422.78 | $388 | 33% |
| Sept. 30, 1952 | Pilots | 80 | $ 41,581.56 | $520 | |
| Dec. 31, 1952 | Pilots | 86 | $ 59,157.80 | $690 | 33% |
| Sept. 30, 1950 | Stewardesses | 44 | $ 7,229.47 | $164 | |
| Dec. 31, 1952 | Stewardesses | 46 | $ 10,339.25 | $225 | 37% |
| Jan. 1, 1950 | Mechanics | 124 | Av. Hourly Pay | $1.70 | |
| Feb. 15, 1950 | Mechanics | 124 | Av. Hourly Pay | $1.76 | |
| July 1, 1951 | Mechanics | 126 | Av. Hourly Pay | $1.90 | |
| Feb. 16, 1952 | Mechanics | 116 | Av. Hourly Pay | $2.06 | |
| Mar. 15, 1953 | Mechanics | 117 | Av. Hourly Pay | $2.10 | 24% |

### How Engine Parts Costs Have Skyrocketed
(FROM FRONTIER AIRLINES STUDY)

| Pratt & Whitney Part | Quantity Used Yearly | Av. Yearly Cost 1947-1950 | Cost for 1953 | Increase |
|---|---|---|---|---|
| Cylinder | 240 | $4,200.00 | $14,400 | 343% |
| Pistons | 120 | $ 264.00 | $ 780 | 295% |
| Master Rods | 35 | $2,625.00 | $ 7,775 | 297% |
| Crankshafts | 18 | $1,350.00* | $5,400-$ 7,200† | 400-533% |
| Bearings | 25 | $ 965.50 | $ 1,107 | 14.7% |
| Total Engine Parts Costs As Listed | | $9,409.50 | $29,462-$31,262 | 313-332% |

*New.
†Reconditioned.

Notes: Propeller blades, 36 of which are used annually, have gone up from $75 to $135. AN hardware and carburetor parts, previously purchased from surplus and now bought new, are up 25%. AN fittings have increased 65% in price and when purchased new will rise another 15%.

# The Pioneer Dilemma

## A far-reaching decision and its significance to local air service

By TOM ASHLEY

TWO attempts by local service airlines to replace aging and inefficient DC-3's with newer and improved transports have been made, first in 1952 by Pioneer Air Lines and again in 1953 by Southwest Airways. Both projects have been ruled against in recent Civil Aeronautics Board decisions which refused to adjust mail pay to cover initial cost increases occasioned by the experiments, both with Martin 202's.

In its refusal, the Board has gone on record as stating that the Martin 202 is not suitable for local service because it was designed for trunk airline service, and that the Martin 202 can not meet the problems of local carriers. The Board's view is that replacement of DC-3's with Martin's by Pioneer was "not warranted under economical and efficient management" of Pioneer's route.

The Board's decision in the Pioneer case is closed. It was a unanimous refusal and its language was sharp and pointedly against Pioneer's replacement of DC-3's with Martins.

### Straight-Jacket Concept

But the decision poses widespread significance to all local air service. In effect, the Board's decision has said, for example, that a local carrier must always remain a local carrier. There is no opportunity for any more "trunks" or even for "junior trunks," in the Board's view. The Board gave Pioneer life, it pointed out, to carry out a mission which is "the provision of service to intermediate points along its route." This apparently is intended to mean that Pioneer has no mission to emphasize service between its terminals.

The passage of time and developments may alter such a concept of local service, especially in areas of rapid growth. But the Board's flat and insistent statement does not allow for any flexibility—it places local carriers in a straight-jacket.

Pioneer made a mistake insofar as the Board is concerned, but not insofar as Pioneer management is concerned. The Board's decision in this respect reaches beyond Pioneer to affect other local carriers. It can be expected to discourage and reduce progressive and aggressive management and thereby result in management's tendency to kow-tow to the Board for all kinds of decisions. Such a projection of the Board's judgment into local management could weaken the carriers disastrously and put an end to the initiative and courage which local service development needs now more than ever. The Board could have been just as final and absolute without some of the phraseology with which it questioned Pioneer's management.

As for effects of the case on the industry at large, it goes without argument that finance and investment capital from stockholders, banks and securities institutions will become more difficult to obtain by local carriers. All of their certificates are temporary, and this alone has made financing difficult. Even so, Pioneer had been unusually successful in its financing of the Martin transition. This was considered in financial circles as an opportunity for Pioneer to generate additional traffic and thus reduce its dependence on subsidy, the result being that Pioneer would become a better financial risk. Pioneer's stockholders were in agreement with this line of thinking, for they approved and participated in the issuance of additional stock which was necessary to supplement bank borrowings to finance the Martins. The Board's decision against the project has now impaired investor and financial confidence in local air service, and the effects here are not likely to be readily overcome by Pioneer or other local carriers.

In ruling against supporting the Martins, the Board waited almost a year to make its decision. Pioneer began its first Martin operations in June, 1952, after petitioning the Board for a change in its mail pay to cover the increased costs of operations. It had previously substituted DC-3's for smaller Lockheeds and was successful in making the change-over even though additional mail pay had been necessary. There had been past Board decisions supporting equipment changes for other airlines involving higher initial mail rates. But this time, when the Board finally decided the case after some 10 months in which Pioneer continued to operate Martins instead of DC-3's, the decision was against support of the equipment change and lower mail pay based on DC-3 costs was applied.

### Service To Fit DC-3, Not Public

With this kind of timing and treatment by the Board to go by, any future equipment changes by local airlines will be timidly approached, to say the least. The effect is to chain the locals forever to the DC-3, even with the certainty of complete dependence on subsidy. Such a consignment discourages further initiative or efforts to keep pace with traffic needs in a progressive development of service, for the tendency will be more than ever to pattern local service to fit the needs of the DC-3 as an airplane rather than to meet the needs of the communities being served. A secondary air transportation system based on this pattern can hardly be in keeping with the process followed in the successful development of America's trunk airline system. The trunk system could never have reached its present pinnacle under the restrictive straight-jacketing now applied to the local carriers by the Board.

The Pioneer dilemma brings to the surface in forceful terms the urgent necessity for a modern, efficient airplane replacement. This need has been recognized for years, but nothing has been done about it although there has been plenty of talk on the part of the Board and the carriers alike. A Canadian airplane, a Swedish one and other foreign designs have been the

main points of conversation. But they are farther from reality now than they were a year ago as costs spiral steadily higher. The Board has talked frequently of supporting a prototype development, but no action has yet been taken to translate this interest into positive action. "Prototype" has become an elusive dream in local service discussions.

Pioneer did take positive action when its traffic overburdened its fleet of DC-3's. Pioneer thereby became a martyr to the acknowledged and recognized equipment dilemma facing the industry.

As a result, Pioneer has had to face several alternative moves. Because it had long since disposed of its DC-3's, it could not immediately replace the Martins. It could curtail some of its Martin operations or all of them, the latter meaning liquidation and going out of business in which case the Board would have assigned its route to one or more other local airlines. The problem was a crisis, for with its decision the Board had not only refused to allow additional mail pay covering the increased costs already incurred by Pioneer while awaiting the decision, but had established a rate based on DC-3 operations which was lower than Pioneer's previous DC-3 rate.

The course adopted by Pioneer was to curtail its flying, release some of its personnel and make other economies to fit its financial position. It immediately offered all of its Martins for sale and began searching for DC-3's. As of the end of May, no purchasers had taken any of the Martins off Pioneer's hands. One of its sales efforts was to offer the Martins to corporations for use as executive transports, the price being in the neighborhood of $485,000. With the purchase of an airplane, the buyer was also offered a "package" maintenance deal whereby Pioneer's facilities were made available as a means of ensuring adequate maintenance standards.

While Pioneer believes it will move the Martins and probably at a profit, this may or may not be the immediate case. Some executive aircraft users prefer a pressurized airplane if they go to the Martin's performance category. No such aircraft is available at this time, however, in the price range quoted by Pioneer.

### Discouraging Outlook

If and when Pioneer changes back to DC-3's, it will not face the same problem which confronted it when it last operated DC-3's, for a year has passed and with it traffic has increased along with the growing need for air service at the points it serves. So Pioneer's problem will be greater than formerly from the standpoint of efficiently handling increased traffic demands with inadequate equipment.

The result of this can very well be less service now with DC-3's than a year ago with DC-3's. Pioneer estimates a pattern of operations now as then would "unable" approximately 40,000 passengers during the first full year of resumed DC-3 operations at the specified capacity to which it has been restricted by the Board's decision. This figures out to be some 10,000,000 revenue passenger miles as a measure of demand which Pioneer will not be able to meet with DC-3's.

While this effect on Pioneer is considerable, the impact takes on far-reaching significance when applied to all local service if the Board's decision can be taken as a policy.

But it need not be necessarily so. The Pioneer dilemma can serve to stimulate action in community, investor, industry and government quarters for a more forthright, aggressive federal policy. Whatever happens to Pioneer, the greater challenge must still be faced, and that is the development of modern air transportation to the many growing communities of America which can never be served by the trunk airlines. Iron-clad adherence to the obsolete, subsidy-hungry DC-3 has already handicapped that development and will prove even more of a hindrance in the future.★★★

Nine Martin 202's were operated by Pioneer for 10 months before a Civil Aeronautics Board decision refused to support the trial.

# Trends in CAB Policy

## The second round of certificate renewals poses a pattern for long-term operations

By GORDON M. BAIN,
Director, Bureau of Air Operations,
Civil Aeronautics Board

DURING the 12 months ending May 1, 1953, the Civil Aeronautics Board has continued to examine the local service carrier experiment and the thinking of the Board with respect to changes which must be made in order to insure maximum progress in this field has been reflected in its decisions.

Practically all of the local service carriers have completed operations under their initial authorizations and some are nearing the completion of operations under their renewed authorizations.

It is evident that by the time the local service carriers reach the point where their operations will be again reviewed for the second renewal period the Board will be faced with decisions which must in many aspects, at least, set the pattern for long-range operations.

### Encouraging Results

From the standpoint of the Board the experience to date has been very revealing and the progress made by the local service carriers has been, to a large extent, encouraging. In establishing the local service carriers the Board was seeking to round out a sound air transportation plan for domestic United States. The experiment was based upon the belief that any sound transportation plan must ultimately encompass air service to the smaller communities of the United States, as well as to the larger metropolitan centers. The experiment was designed to determine whether or not service to these smaller communities could best be performed by carriers whose efforts would be primarily devoted to such service.

In authorizing operations by the various local service carriers, the Board has repeatedly stressed the importance of making progress toward self-sufficiency, with the ultimate objective of operations without subsidy support.

There have been a number of instances in which local service carriers have demonstrated progress toward reducing their subsidy requirements, although it should be carefully noted that the subsidy requirement for the local service industry has steadily increased and there is little or no evidence that this trend will be reversed in the immediate future.

### Use-It-Or-Lose-It Policy Followed

It is almost axiomatic in the airline industry that profitable operations, assuming efficient management, are dependent on the density or the traffic potential of any given route structure. Therefore, during the last 12 months the Board has devoted major attention toward the elimination of weak route segments and communities in an endeavor to strengthen the revenue-producing capacity of the local service carriers. The Board's point of view toward service to smaller communities can be expressed in the phrase "use it or lose it," on the theory that if a community does not demonstrate ability to generate traffic, there is no economic justification for the continuance of service. In evaluating requests for service to communities not now served, the Board is also placing great emphasis on assurance that if service is provided a reasonable volume of traffic will be realized. In arriving at such decisions, however, the Board has carefully evaluated other factors, such as isolation.

The Board's recognition of the progress which has been made by some of the local service airlines is clearly indicated by the 7-year renewals of Mohawk Airlines and Piedmont Airlines.

### The Pioneer Case

From the standpoint of the local service carrier industry, the most important policy decision of the Board in the last 12 months was embodied in the Pioneer Mail Rate Decision. The Board is fully aware that Pioneer has in the past and will in the future make substantial contribution to the development of the local service industry. In this particular proceeding, however, the Board was asked to underwrite additional subsidy requirements of Pioneer Air Lines because of equipment changes. In June, 1952, Pioneer Air Lines substituted Martin 202 equipment for the DC-3 equipment which it had previously operated. The carrier requested mail pay of approximately $2,200,000 to support this change in operation for the first year. This represented more than double the amount that the carrier had received in the previous 12 months for the operation of DC-3 equipment. The Board in its decision indicated that over a 5-year period the additional subsidy required because of the operation of Martin 202's would be in excess of $3,400,000.

The Board concluded that the additional subsidy could not be underwritten because "Pioneer Air Lines, Inc.'s action in re-equipping its fleet with Martin 202 aircraft did not meet the statutory requirements of economical and efficient management, and therefore the carrier may not be awarded the substantially increased mail-pay compensation sought by the carrier."

In reaching its decision, the Board stated:

"The Martin 202 was not designed to meet the economic or operational problems of a local air service system, but was tailored to trunkline requirements. No matter how much money we might pour into support of a Martin 202 operation over Route No. 64, we would not be advancing one step further towards a better and more economic aircraft for local air service. As a matter of fact, we are on notice that Pioneer only considers the Martin as an interim aircraft. The carrier has had on order five Convair 340 aircraft, which are larger, faster, and more expensive than the 202, and which, like the Martin, were designed with trunkline requirements primarily in mind.

## LOCAL SERVICE CARRIERS CERTIFICATE AUTHORIZATIONS

| Carrier | Original Certificate | | | | Renewed Certificates | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Effective Date | Date of Service Inauguration | Term | Expiration Date | First Renewal Term | First Renewal Expiration Date | Second Renewal Term | Second Renewal Expiration Date |
| Allegheny | 1-11-49 | 3- 7-49 | 3 years | 1-11-52 | 5 years | 12-31-56 | | |
| Bonanza | 11-22-49 | 12-19-49 | 3 years | 12-31-52 | (In process) | | | |
| Central | 11-14-46 | 9-15-49 | 4 years | 5-14-50 | 3 years[1] | 2-19-56 | | |
| E. W. Wiggins | 6-13-46 | 9-19-46 | 5 years | 3-31-51 | (In process) | | | |
| Frontier Route 73 | 3-28-46 | 11-27-46[2] | 3 years | 3-31-49[2] | 1 year[4] | 3-31-50 | | |
| | | | | | 5 years | 3-31-55 | | |
| Route 74 | 3-28-46 | 5- 3-47[3] | 3 years | 3-31-49[3] | 1 year[4] | 3-31-50 | | |
| | | | | | 5 years | 3-31-55 | | |
| Route 93 | 6-29-48 | 6- 1-50 | 3 years | 6-29-51 | 4 years | 3-31-55 | | |
| Lake Central | 2- 6-48 | 11-12-49 | 3 years | 2- 6-51 | 4 years | 12-31-54[5] | | |
| Mohawk | 6-28-48 | 9-19-48 | 3 years | 6-29-51 | 7 years | 6-30-58 | | |
| North Central | 10- 3-47 | 2-24-48 | 3 years | 10- 3-50 | 5 years | 9-30-55 | | |
| Ozark | 9-26-50 | 9-26-50 | 3 years | 9-26-53 | (In process) | | | |
| Piedmont | 12-12-47 | 9-20-48 | 3 years | 12-13-50 | 7 years | 12-31-57-[6] | | |
| Pioneer | 11- 5-43 | 8- 1-45 | 3 years | 12-31-46 | 3 years | 11-14-49 | 5 years | 9-30-54[7] |
| Southern | 2- 8-49 | 6-10-49 | 3 years | 2- 8-52 | 5 years | 12-31-56 | | |
| Southwest | 5-22-46 | 12- 2-46 | 3 years | 11-22-49 | 5 years | 9-30-54 | | |
| Trans-Texas | 11-14-46 | 10-11-47 | 3 years | 5-14-50 | 4 years | 3-31-54[8] | | |
| West Coast | 5-22-46[9] | 9-28-46[9] | 3 years | 9-28-49[9] | 5 years | 9-30-54 | | |
| | 5-22-46[10] | 12- 5-46[10] | 3 years | 11-22-49[10] | | | | |

[1]Central: Effective 3-year term for the renewed route as amended. [2]Monarch Air Lines, before merger. [3]Challenger Airlines, before merger. [4]1-year extension. [5]Show-cause proceeding covering a 1-year extension to 12-31-55 is in process. [6]Except Segment 1: to 7-25-53. [7]Except Segment 4: to 9-30-52. (Show-cause renewal case is now before the Board for decision.) [8]Except Segments 2 and 6: to 3-31-52. (Renewal case has been submitted to the Board for decision.) [9]Empire Air Lines, before merger. [10]West Coast Airlines, before merger.

—Civil Aeronautics Board, May 28, 1953.

"It is also of concern to us that replacement of Pioneer's DC-3's by the Martin may have impaired this carrier's ability to provide additional local service in the area which it serves."

Southwest Airways Company requested a final mail rate which would underwrite the use of two to three Martin 202 aircraft over certain of its route segments. Even with the limited operations proposed, Southwest forecast that it would require approximately $244,000 additional mail pay per annum over that regarded by the Board as fair and reasonable for operations with DC-3 aircraft exclusively if two Martin 202 airplanes were underwritten and approximately $258,000 above the DC-3 requirement if three Martins were recognized.

Consistent with the findings in the Pioneer Mail Rate case, the Board refused to underwrite the operation of the Martin 202, holding that the establishment of a mail rate for Southwest Airways higher than that required for operation solely with DC-3 aircraft would not be consistent with the objectives of the Civil Aeronautics Act.

Southwest Airways has operated two Martin 202 aircraft since April 26, 1953, and, it is understood, plans to add an additional 202 in the near future. In this instance the company recognizes that the "Martin experiment" is a management responsibility which will not be underwritten by additional mail pay. The company has demonstrated a willingness to risk private funds in an attempt to prove that the Martin 202 in the limited operations contemplated can be operated at a rate equivalent to that established for the DC-3.

It has been stated that the Board is only interested in providing "second class service" to the smaller communities. The only real issue is one of adequate vs. inadequate service. It is the announced policy of the Board to provide adequate service to these communities, and the Board has repeatedly stated that it will support the development of an appropriate aircraft for local service operations and underwrite the operations of a suitable aircraft in appropriate local service cases.

If the local service experiment is to succeed, the Board must ever keep in mind the objective of reducing, not increasing, the subsidy requirements of this type of service. The Board's concern in the Pioneer Mail Rate Case was the increased subsidy demand occasioned by the use of an aircraft designed for trunkline service and which showed no potential for adaptation to local service industry use on an economical basis.

During the last 12 months the Board has renewed the routes of eight carriers, including Allegheny Airlines, Central Airlines, Empire Air Lines, Frontier Airlines Route 93, Lake Central Airlines, Mohawk Airlines, Piedmont Aviation and Southern Airways.

The Board in October 1952 denied E. W. Wiggins Airways' application for route renewal and modification but, at the time this article is being written, the carrier's petition for reconsideration has been granted and the case is before the Board.

### Local Service in 45 States

Effective with these renewals and the merger of West Coast Airlines and Empire Air Lines, the 15 local service carriers now serve 45 of the 48 states.

In the renewal cases which have come before it, the Board has examined each element of progress or weakness, i.e., generation of traffic at each city served, the travel needs of each community served, traffic and revenue attainment on each segment of a carrier's route, the advisability of suspending trunkline service at communities also served by the local service carrier or at communities for which the local service carrier could provide the air transportation to meet travel needs of those cities, and the financial status of the carrier throughout and at the close of its first period of operating authority.

Based on consideration of the factors of progress, either experienced or anticipated for the future under conditions of operation of the renewed, modified routes, the Board has shown great confidence in the development of local services by extending some carriers' authorizations for five to seven years. Mohawk Airlines and Piedmont Airlines, both of whom initiated their first service in September 1948, had progressed so outstandingly in the development of traffic and revenue that the Board authorized renewal terms of seven years, until 1958, for each of them. In connection with the Mohawk renewal, the Board stated:[1]

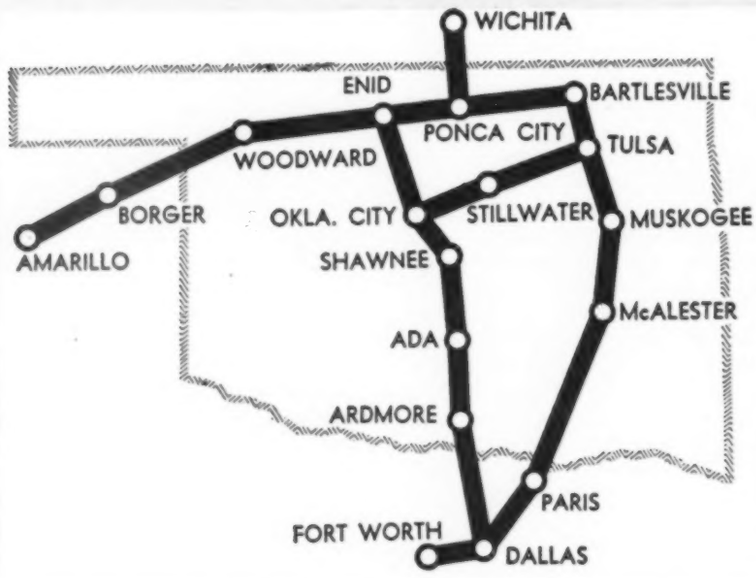
". . . We have recently considered the question of the duration of the renewal period for another outstanding local service carrier. (Piedmont Certificate Renewal Case, Order Serial No. 6460, adopted May 26, 1952.) We there decided that a renewal period of seven years from the date of expiration of the original certificate would satisfy the public interest in maintaining a close control over the local service pattern while rewarding the carrier for

[1]Robinson Airlines Corporation Certificate Renewal Case, Docket 4947 et al., Order Serial No. E-6541, June 24, 1952.

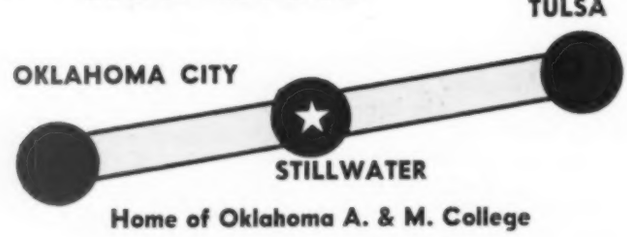
CENTRAL AIRLINES

NEW PICTURE

New Route Pattern




New Route

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its achievements and offering an incentive to other such carriers to strive for comparable results. We are satisfied that a renewal for a similar period would be appropriate in this case."

## Each Station Studied in Decisions

Close scrutiny of each station and each segment of a carrier's route is made by the Board as a basis for decision covering renewal, modification, or elimination of any part of the route. Consideration is given to the volume of traffic benefited by the provision of air service to each city and segment, to competitive services which may be operated, to the service on each segment from the standpoint of aircraft utilization and scheduling.

The Board has not hesitated to eliminate whole segments when, in its judgment, the public convenience would not greatly suffer and when the carrier's system would be made more effective by the elimination of certain services. In this regard, the Board stated in its decision covering the elimination of Southern Airways segment 3:[2]

". . . In establishing Southern's system the Board could not have foreseen with certainty just how all traffic flows and communities of interest would work out over each route segment. . . (Savings in mail pay) represent a substantial sum and where, as here, it is clear from the lack of public patronage that there is no substantial need for the service, there seems to be no justification for further Government support. . . . The comparatively little use made of Southern's service by these cities (on Segment 3) indicates that they will be losing something for which they have but little need."

The Board makes every effort to extend service, in order to promote and encourage the traffic development at communities which have shown progress during the period they have received service from the local service carrier. However, in the case of individual cities as well as segments, the Board does not hesitate to eliminate service where service has not been used. Concerning individual stations under consideration in the Central Renewal Proceeding (Docket 4083 et. al.), the Board said (Order Serial E-7177):

". . . The Examiner eliminated Arkansas City-Winfield, Kans., Wewoka, Okla., Gainesville and Greenville, Tex. We will in addition eliminate Pampa, Texas, Norman, Durant and Okmulgee, Okla. At all of these points, as noted by the Examiner, station expenses have exceeded station revenues by considerable proportions. None of these points has an isolation problem comparable in seriousness to Woodward's, and none attained as large a traffic volume in 1952 as Shawnee. Traffic enplaning at these four points ranged from a little more than 1 per day in the case of Durant to 2 per day in the case of Okmulgee during the first nine months of 1952. It is also significant that neither Pampa, Durant or Okmulgee has demonstrated a favorable trend in the develop-

[2]Southern Certificate Renewal Case, Docket 5199 et al., Order Serial No. E-7301, April 14, 1953 (adopted Initial Decision of Examiner, issued December 8, 1952).

ment of traffic comparable to that shown by either Shawnee or Ardmore. At Pampa traffic volumes in the quarters ending March, June and September of 1952 were in each case less than they were in the corresponding periods of 1951 with the same volume and type of service. At Durant traffic volume in the third quarter of 1952 was smaller than in the corresponding period of 1951 on the same volume and type of service. The peak in traffic development at Durant was attained in the quarter ending September, 1951, when 172 passengers boarded at this city. Traffic volume at Durant never again equalled that number in any quarter thereafter. At Okmulgee, comparisons between the first three quarters of 1951 and those of 1952 cannot fairly be made because the volume of service has not been the same for both periods. With respect to this city, however, it is significant that the changeover from single engine to multi-engine aircraft was not followed by an upsurge in traffic as at Shawnee. . . ."

As indicated by the statement above, the Board does consider isolation of a community as a mitigating factor in the application of any standard on which to base judgment covering traffic development. Consideration of such isolation factors is inherent in the Declaration of Policy of the Civil Aeronautics Act (section 2 (a) ) which says that the Board "shall consider . . . the encouragement and development of an air-transportation system properly adapted to the present and future needs of the . . . domestic commerce . . ." The Board's concern over the need for, and the provision of, air service to extremely isolated communities was expressed in its decision in the Frontier Route 93 Renewal Case[8] as follows:

". . . In the Arizona-New Mexico Case, 9 CAB 85 (1948) where we authorized Arizona Airways, Frontier's predecessor, to provide local air service, *inter alia*, over two segments southeast of Phoenix, we recognized that 'the communities in general are of such relatively small total populations as to render doubtful, under ordinary circumstances, the probability of sufficient use by the public to warrant the operation of local air service.' We noted, however, that 'the distances between the smaller population centers and their trade area centers, and the barriers to surface transportation which are raised by the terrain, operate to isolate the small communities to such an extent that air transportation will be unusually advantageous in comparison with travel by surface transportation.' Based principally upon this evaluation of the problem, we authorized an experiment in local air transportation to determine whether sufficient use would be made of the service provided to warrant its cost to the Government.

"We are now called upon to evaluate the results of that experiment and to weigh the extent, if any, of any further test of local air service in this area . . .

". . . We think that the record clearly demonstrated that renewal of all of Frontier's service in this area is not warranted. Continuation of Frontier's present service would cost the Government about $490,000 a year in mail pay support. In view of the limited number of persons utilizing Frontier's service, a reduction in this mail pay obligation is obviously required . . .

[8]Docket 4522 et. al., Order Serial No. E-7192, February 27, 1953.

(*Continued on page* 52)

# THANKS to our FRIENDS in the INDUSTRY . . .

**more than 50 percent of our passengers travel "interline." We want our friends to know that this healthy exchange of passengers is greatly appreciated.**

**Last year PIEDMONT flew 50,434,816 passenger miles and carried 244,702 passengers, establishing a record in the local service field. The helpful cooperation of the airlines has contributed much to this record and our 5 years of progress.**

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5-28

Transport helicopters in advanced engineering stages include this one pictured by Hiller Helicopters of Palo Alto, California. Details have not been released on this and other rotary-wing transports in the 20-passenger and larger sizes now being engineered by several manufacturers. The Hiller Sky Bus is jet-powered. —(Hiller Sketch.)

# The Transport Helicopter In Local Service Operations

By
**DAVID E. POSTLE,**
Director of Research, Mohawk Airlines, Inc., Ithaca, N. Y.

DURING the past 12 months, many articles have appeared in the press regarding the use of very high speed jet or turbo powered aircraft in long-range airline operations. However, not so well publicized, two recent events mark the alertness and interest of the scheduled airlines in short-range, or local service operations: (1) the formation of a committee on helicopters by the Air Transport Association, and (2) the symposium on helicopters conducted in Puerto Rico by the International Air Transport Association. Although the writer is a member of the above ATA Committee, no ethical platform would permit forecasting recommendations which will be made to the Air Transport Association. However, these two significant events permit one to conclude that, given the appropriate machine, the scheduled airlines will move swiftly to improve their local service operations through use of the transport helicopter.

Mohawk Airlines, successfully engaging in certificated scheduled local service transportation, is keenly interested in the development of the transport helicopter for several reasons:

1. The Douglas DC-3, standard equipment throughout the world in short-haul air operations, is no longer in production and a suitable replacement for this reliable aircraft must be found.

2. Passenger travel time from one city center to another must be substantially reduced in order to achieve the required degree of penetration in the short-haul passenger market, and the importance of this factor increases as the travel distance is reduced.

3. There are many communities which need and could support air service but which cannot now benefit from air transportation because terrain or expense preclude construction of an adequate airport.

4. Expansion of air passenger service to many communities within existing route structures, in addition to better, faster service at terminal points, will greatly increase passenger volume to the point where Mohawk's objective of self-sufficiency may be attained at an earlier date.

Because there is every indication

that the transport helicopter will fulfill the above requirements, Mohawk has devoted a great deal of time and study to the manner in which this new vehicle can be effectively applied to airline use. In the light of its unique flight characteristics, it obviously is an aircraft well adapted to local service, inter-city operations. The helicopter will provide excellent connecting service between large air terminals and cities within a considerable radius on the one hand, and on the other, it can provide fast inter-city service without the need for ground transportation by limousine at each end of the flight. The helicopter needs no expensive airport from which to operate in the smaller communities, and it has every potential of being an extremely comfortable, popular means of travel.

### Two Types of Helicopter Operations

Mohawk's analysis of the transport helicopter clearly indicates that, as a short-haul means of transportation, it will serve in two distinct spheres of operation: the metropolitan type of service, linking cities within large metropolitan areas, such as Los Angeles, Chicago and New York, with key trunk line air terminals and with downtown metropolitan centers by means of routes radiating from such centers; and the local inter-city type of service, providing transportation along lineal routes such as Buffalo-Rochester-Syracuse-Utica-Albany and serving many smaller communities between these cities.

While the passenger market in either type of operation has a very substantial potential, Mohawk believes that the greatest role of the transport helicopter lies in the latter, or the local inter-city sphere of operation. Indirect operating expenses can be materially less in inter-city operations while direct operating expenses can be reduced through more efficient scheduling and increased aircraft utilization when compared to the requirements of the metropolitan type of operation.

These factors point to the early success of the transport helicopter in the inter-city field as well as to the probable self-sufficiency of local service airlines within existing route structures in densely populated areas of operation.

### First Transport 'Copters To Fly Soon

Unfortunately, details of larger multi-engine transport helicopters now being built in prototype stage are shrouded in darkness by military security requirements. Twenty, thirty and fifty-passenger helicopters will be test flown within a few months. The Korean War has greatly speeded the development of the transport helicopter. Engineering skill, new materials and production methods, and aerodynamic knowledge — not available during the development of the fixed-wing transport — will bring the transport helicopter into being faster than is generally realized.

However, before the transport helicopter can be applied successfully to scheduled air transportation, there are many problems to be solved which are entirely new and in which we have no experience to serve as a guide. In the solution of these matters, the answers will be found only through the whole-hearted cooperation of all interests involved. To this end, the following factors must be borne in mind:

First, the scheduled local service and trunk airlines must be fully aware of the fact that the helicopter is an entirely different type of "animal" and does not belong to the fixed-wing breed of aircraft. Its flight characteristics are entirely different, maintenance and overhaul of its various components will be more complex, and the techniques of flight and operating procedures will be new in the air transport field.

Direct operating costs of the helicopter will be higher than for comparable-size fixed-wing transports, and indirect costs will require concen-

## The Helicopter in Inter-city Travel

LET'S examine the advantage of a transport helicopter with a cruising speed of 125 mph. and its ability to provide downtown-to-downtown air service in comparison with the fixed-wing transport in local inter-city service. This is important, for it deals with one of the most serious problems in air transportation today—the expense, inconvenience and loss of time required by airport-to-city travel.

In long haul trunk line operations, this matter is of less importance than in short haul local service, for the air passenger more readily accepts this inconvenience in order to profit by fast transportation between airports several hundred miles apart. For example, non-stop schedules between New York and Chicago, a distance of 724 miles, require 3.42 hours. The passenger makes this trip at an average scheduled speed between airports of 212 mph. at a fare of about 6.1c per mile. If we add the time and total cost of airport-to-city travel at each end of this journey, we find that the trip from New York to Chicago requires 5.42 hours, averages 134 mph. and total passenger fare is about 6.5c per mile. Thus the total time for the trip is at least 3.4 times as fast as any other form of transportation, total cost of the limousine service in ground travel is only 6% of the air fare, and total time for limousine service is 58% of the flight time.

### 37 mph. by DC-3

In short haul, local service operations, however, we have a different picture. For example, a DC-3 passenger traveling between Buffalo and Rochester, a distance of 55 miles, completes the flight between airports in 28 minutes, at an average scheduled speed of 118 mph., and at a fare of about 8.1c per mile. However, if we add the time and total cost of airport-to-city travel at each end of this journey, we find the trip from Buffalo to Rochester requires 1.8 hours, averages only 37 mph., and the total passenger fare is about 11.9c per mile. While this trip by air is much more comfortable than any other form of transportation, total cost of limousine service amounts to 47% of the air fare, and total time for limousine service is 286% of the flight time, with no allowance for limousine connections or baggage transfer. These figures apply to a DC-3 scheduled time of 28 minutes, but it is interesting to note that American Airlines schedules the same trip with Convair equipment in 27 minutes and Capital Airlines schedules the trip in 28 minutes with DC-4 equipment. Thus, we see that when much faster airline equipment is utilized between Buffalo and Rochester, the problems of ground travel time, expense and inconvenience presented to the passenger are not solved.

On the other hand, the transport helicopter, traveling over a route 14.5 miles longer than the direct fixed-wing distance, could depart from a conveniently located heliport in Buffalo, serve 2 intermediate stations, and arrive in the heart of Rochester in 40 minutes. This is 68 minutes less than the time required for the city-to-city trip in a DC-3 or in any other form of transportation, and in such operations, flight characteristics accumulate to the decided advantage of the helicopter.

—By DAVID E. POSTLE, Mohawk Airlines, Inc.

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*Ozark Air Lines is a major link in America's air transportation, providing fast, convenient connections with all major air lines. Ozark's fast, dependable service assures you of greater operational efficiency, too. For business and for pleasure . . . fly Ozark . . . now serving nine midwestern states.*

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*CAB examiners recommendations

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trated study and considerable ingenuity to keep them below those of the fixed-wing operation.

Because scheduled air transportation will penetrate a new passenger and cargo market in short haul operations, a new approach to the design and analysis of route structures must be made.

Our present concept of IFR and VFR conditions, as well as our present methods of reservations, ticketing and passenger handling must be changed and adapted to the helicopter. In all probability, the helicopter will require its own system of navigating aids in inter-city operations.

The unequaled experience and know-how of the scheduled airlines in air transportation will be invaluable in finding the practical solution to these problems, but we cannot operate the helicopter successfully if we consider it as "just another airplane."

### Government Agencies Alert and Cooperative

Second, federal, state and municipal authorities have been very alert to the potential of the helicopter in air transportation, and the general public will reap the benefit of this potential through their continued cooperation with the airlines and the helicopter manufacturers in planning for the future.

**WORLD'S FIRST LICENSED HOTEL HELIPORT** was opened with aviation writers in attendance. It is located in Fort Worth at the swank Western Hills Hotel. Built to CAA specifications, it measures 150 by 190 ft. with a 50-ft. square "pad" in its center. It is lighted for night operations. Two Bell Model 47's made the dedicatory landings. A few days earlier, three large Army helicopters landed at the hotel's heliport on a cross-country flight from Nevada to Georgia. Weather conditions held them there for two days, their pilots said.

—(Bell Aircraft Photo.)

The CAB and CAA have been extremely cooperative and foresighted in this respect and have refrained from the promulgation of restrictive regulations before operating experience is gained. These agencies, together with the state and municipal authorities and the various scheduled airlines, can do much to speed the early development of both inter-city and metropolitan helicopter services, and future centrally-located heliport sites can be planned.

### Multi-Engine Safety Emphasized

Third, airline operating experience has proved that safety is of prime importance, that aircraft safety in a large measure depends on an ample margin of performance, and that in performance there is no substitute for power. Because the helicopter will be operating over congested areas and into the centers of cities, we must design scheduled passenger operations with an extra degree of safety and as free from the nuisance of noise as possible.

Thus, the helicopter manufacturers must provide the airline industry with transport helicopters which have the ability to operate quietly, with sufficient reserve performance to operate safely over congested areas and into very small heliports. Twin-engine or multiple-power units must be utilized not only to carry the load of 20, 30, or 60 passengers with baggage, but to provide for safe night and eventual instrument operations in the event of the failure of a power unit, as well as for on-time completion of schedules. Without these features, the helicopter will fail to gain the place in air transportation warranted by its unique flight characteristics.

The scheduled airlines, the federal, state and municipal authorities, and the helicopter manufacturers have an equal share in the responsibility of applying the helicopter successfully to scheduled transportation. The rewards to each are great and well worth every effort required. If the present trend continues in this whole-hearted approach to the solution of the many problems involved, there can be little doubt that — along with the development of the jet and turbo-powered long-range transport — the transport helicopter will fulfill its just role and make possible a new era in local service air transportation. ★ ★ ★

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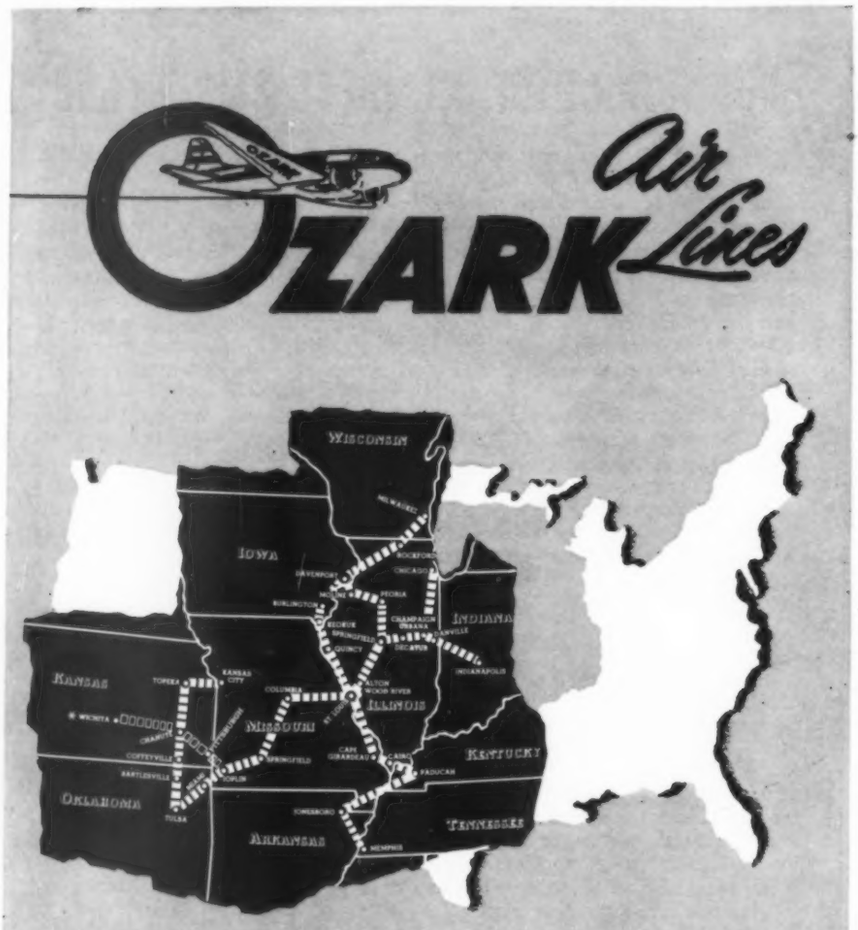


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The scheduled airlines, the federal, state and municipal authorities, and the helicopter manufacturers have an equal share in the responsibility of applying the helicopter successfully to scheduled transportation. The rewards to each are great and well worth every effort required. If the present trend continues in this whole-hearted approach to the solution of the many problems involved, there can be little doubt that — along with the development of the jet and turbo-powered long-range transport — the transport helicopter will fulfill its just role and make possible a new era in local service air transportation. ★ ★ ★


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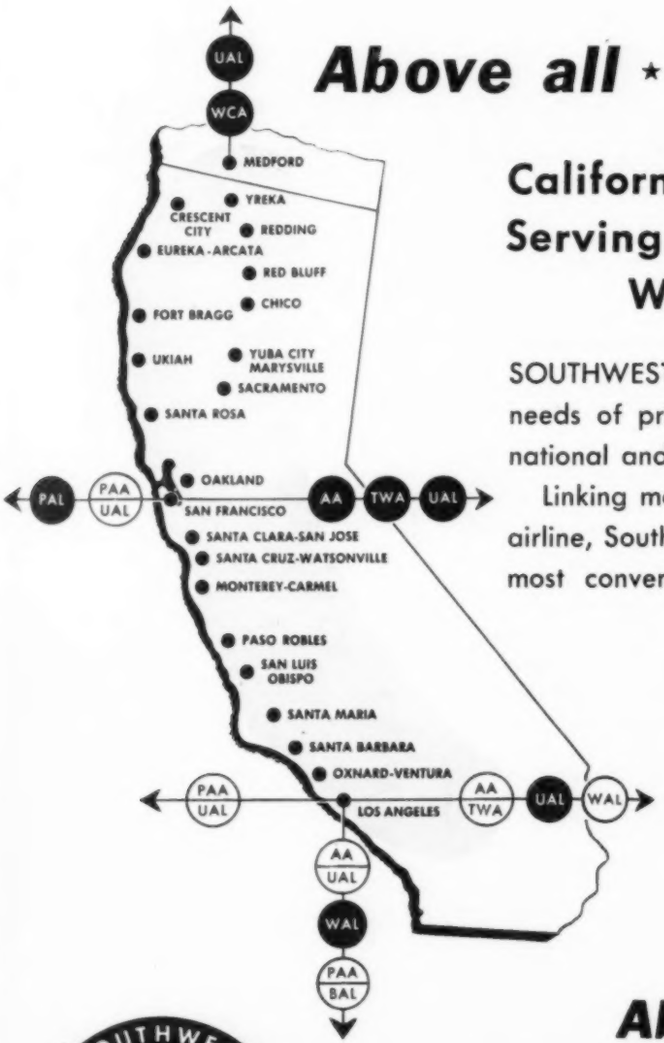


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**SOUTHWEST AIRWAYS**

*California's Own Scheduled Airline*

One of many frank discussions between local officials and Ozark Air Lines, this scene was photographed at Peoria, Illinois. Ozark spokesmen are at the table, with members of the Peoria Airport Authority in the foreground. Friendly cooperation is vital in developing successful local air service. —(Ozark Air Lines Photo.)

# Local Service-Community Relations

## By letting down their hair in regular meetings, airlines and cities can improve service

**By PAUL J. RODGERS**

Executive Assistant to the President
Ozark Air Lines, Inc.

IN reviewing both the progress and the problems of the aviation industry in general during the first 50 years of powered flight, the strides made by the air transport phase of that industry during its brief 26-year history, and the postwar development of the local service airlines, it is obvious that the problem of close cooperation and coordination between the airlines and the communities they serve has been an ever present one.

In a relatively short period of time we have seen relationships between the airlines and the communities they serve run the gantlet from pleasant relationships, encouragement to the air carriers, and in many cases, financial support of the airlines by the communities in the early days, to an aroused, fearful, and annoyed community which actually succeeded in closing one of the largest airports in the world just a year ago.

The local service airline industry certainly has not been spared this perplexing problem of developing a continuous, friendly, constructive, cooperative relationship with the communities which they have been certificated to serve. As we come down the home stretch toward the golden anniversary of flight, and as we complete 26 years of scheduled air transportation of passengers, mail, and express, it is fitting and necessary that those of us in the local service airline industry particularly give this important problem some very serious thought and consideration. The local service airlines are particularly concerned. By the nature of their operations, they normally have a more intimate contact with their communities. Now, during our annual "examination of conscience" which is provided by FLIGHT MAGAZINE, we should not only constructively analyze some of the worthwhile accomplishments of the past in working with the cities but should also look down the road a little to see how we as an industry might improve our particular relationship with those cities which we have been privileged to serve.

Initially, one of the major problems of the local service carriers arose from the fact that those communities which had been receiving service by existing regional and trunk-line carriers had their "tongue in their cheek" toward these small postwar fledgling airlines. They did not feel that these new services were particularly important to them because they were already on the air map, nor did they feel any obligation whatsoever to assist these new and supplementary air services in getting started. Those cities which had not previously been served and which were now put on the routes of local service carriers, were candidly disappointed not to have been placed on the routes of a big-name airline. Many felt that it was an insult and a blow to civic pride to be a local air service town.

Most of this unfortunate attitude on the part of both types of communities has disappeared as these new local service carriers established an "aerial beach head" and demonstrated conclusively to these same cities that frequency of schedules determines the real utility of the service and not the name of the airline on the side of the airplane. Even large terminal-type communities began to sit up and take notice as these small but increasingly important air carriers brought more and more communities within the logical convenient trade area of the larger city. One midwestern city, recognizing the importance of the local service airline, protested that it was being discriminated against when local air service was provided more conveniently in the direction of a large rival city.

There is still a crusade to be carried out in this direction by the local service carriers, however, because at least one community recently officially opposed the recertification of a local service air carrier solely because the com-

munity felt that by so doing they would improve their chances of remaining on the air map as a trunk line stop. There will probably be some resurgence of this type of shallow thinking in the communities if the trend to transfer the smaller cities of 75,000 population or less from the trunk lines to the local service airlines continues. Recent statements attributed, for example, to Senator Johnson (D. Colo.), suggesting that the Civil Aeronautics Board give consideration to transferring some of the local service routes to the trunk carriers, have "pulled the rug out from under" the local service airlines in a most heartbreaking manner just at a time when progress was being made in this field. Governmental leaders both in the Congress and in the Board possibly do not realize the impact of such an announcement in many of the smaller cities which quite naturally will wonder how this particular philosophy will affect them.

### Equitable Charges Needed

After these initial objections and lack of public acceptance in general are overcome and minimized by the local service carrier, a second very real difficulty has been the problem of a mutually equitable agreement for the charges on the facilities to be used at the local municipal airport and at the larger terminal-type airport. Here there has been a refusal or a reluctance on the part of many of the communities to acknowledge the basic differences in the purpose, economics, and operating problems of the new short-haul, local and feeder-type airlines with a temporary franchise just commencing its first years of operation with an average fare of less than $10 as contrasted to the long-haul, regional and trunk carriers operating under the grandfather rights completing 20 or 25 years of operation with an average fare of between $30 and $45.

The local service airline is caught in the cross fire between the clear mandate of the Civil Aeronautics Board to cut all costs and to render the service at the least possible expense to the government and the desire of the local community to get their airport on a self-sustaining basis. This continues to be a very serious difficulty in some of the smaller cities where airport activity has seriously declined since the war—the fixed-base operator may be one step ahead of starvation; the operating costs are rising and the local service airline arrives on the horizon like "manna from heaven" with a nice big, fat subsidy. It is also a very real difficulty in some of the large terminal airports where they have

Some of the 6th grade students who put across a successful air mail familiarization campaign in Oklahoma are shown with merit certificates issued by Central Airlines.

# Air Mail Has to be Sold, Too

MILLIONS of people fail to use the advantages of air mail and air parcel post services, especially in the smaller cities and towns, but local service airlines are doing something about it. One of the locals, Central Airlines, has developed a formula for selling more air mail tonnage so that its cities make full use of air transportation.

"Door-to-door canvassing is the answer—personal contacts to make sure that everybody knows air mail service is available and to persuade them to use this service," says William W. McGhee, Central's director of air cargo. "We are sure of this because we have just proved it."

### How Campaign was Conducted

The test, a huge success, was tried first by Central at Ardmore, Oklahoma, population 17,890, because it has an active Chamber of Commerce, a civic-minded postmaster and an alert school superintendent. Of 256 sixth-grade students enrolled in four schools, 200 entered an air mail collection contest sponsored by the Chamber of Commerce. Each student was briefed on how to call on businessmen and housewives and how to explain air mail service. Each was armed with a letter of introduction, air mail schedules and air mail stickers. It was a 6-day contest and the local newspaper and radio station supported it thoroughly as the door-to-door canvass worked throughout the city. Theme of the sales campaign was: "If a letter is worth writing, it is worth an air mail stamp." Merchandise coupons were donated as prizes to students doing the most effective work as certified by the postmaster through a check of the mails.

"Our air mail collections jumped 67 per cent after the canvass," the postmaster reported. "Collections will continue to hold up because of the excellent selling job the students accomplished." He pointed out that 75 per cent of all air mail collected during the week had air mail stickers of the type furnished the students by Central Airlines.

Because the campaign was so successful in Ardmore, it has been duplicated in three other Oklahoma cities—Ada, Stillwater and Muskogee. ★ ★ ★

These two student canvassers deposit air mail after having their score cards marked by the postmaster.

almost all the activity they can handle, and the local service carrier is practically a gnat in their eye. If the small carrier wishes to operate there, which he must do to perform the feeder aspects of his operation, he must "pay the freight" which may be equal to or greater than the existing rates.

At one major terminal in the midwest, for example, the larger established trunk lines are charged a rate on landing fees of approximately 5c per thousand pounds but the much smaller local service carriers, who are just getting started and who can least afford it, are charged *six times as much —a rate equal to 30c per thousand pounds*. Despite meetings, pleadings, a petition, etc. any change in this status is still "under consideration in channels."

There are also some examples of outstanding community cooperation and understanding. At one of the smaller southern cities the townspeople charged Ozark no rent, no utilities or landing fees for the first 6 months of operation; they even gave us $500 to equip our station. This community recognized and accepted its share of the obligation to help these new carriers cut their costs and increase their revenue. This community recognized and acted upon the fact that it was just as much "on trial" for the three-year experimental period as the local service carrier was on trial for the three-year period. Both the large cities and the smaller cities must realize that they are on trial as far as the government is concerned in their patronage and support of these new services. It is unfortunate that in the instance of some communities, even though they may be convinced some action should be taken to assist the smaller carriers in getting established, they lack the courage to take this action.

### Subsidy for Communities

Recent statements by members of the Civil Aeronautics Board and members of the Congress pointing out that "the Civil Aeronautics Board was not in fact subsidizing those airlines, but rather was subsidizing the smaller communities which received their services"* have been of considerable assistance to the local service airlines in attempting to work out a mutually satisfactory arrangement as a basis of charges during the early heartbreak period of trying to establish these new air services.

This meeting of the minds with the community is normally arrived at, however, only after many hours of discussion and repeated visits to the communities concerned. It represents a new and somewhat disappointing thought to many of the communities because when they surveyed the existing charges prevalent in the industry for office rental and landing fees they, of necessity, took the only data then available. This data, of course, was based on the trunk-line charges which had been arrived at after 20 or 25 years of operation. In our operations to date we have found no substitute for the "let-down-the-hair session" where we meet with our community representatives, take them behind the scenes of our operation, show them in detail our income and outgo at the station, and completely review our progress and problems. The Board's decision to limit the initial period of certification of the smaller cities and the local service carriers to a three-year period has certainly been advantageous because, among other things, it forces the communities and the carriers to get together frequently to work out their problems across the table.

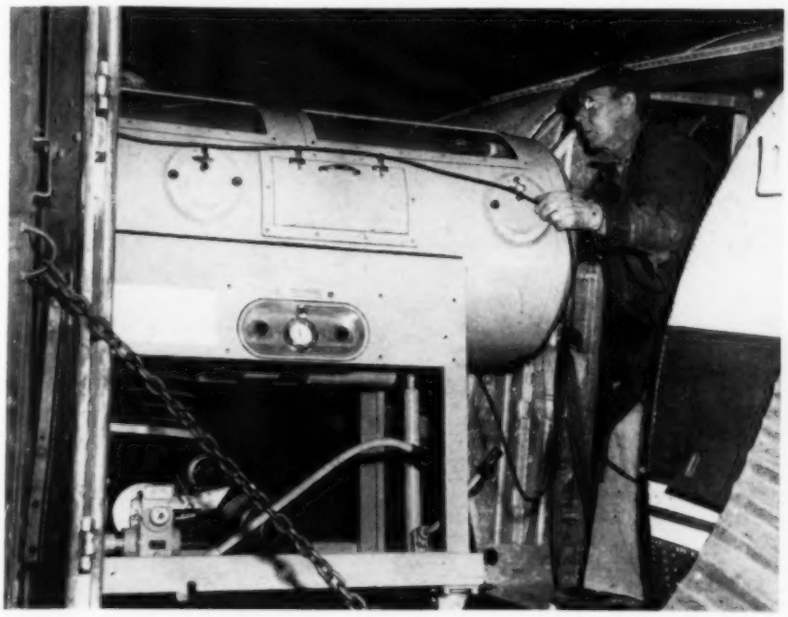
Another serious problem with many of the communities, large and small, has been the difficulty of helping them to realize and act upon any obligation to assist in the development of traffic for these new air services which

*Joseph Adams, CAB-Northwest Airport Management Conference, April 22, 1953.

are still officially regarded as an experiment by the Federal government. It is a strange and disheartening contradiction to observe how some communities will spend thousands of dollars developing an airport facility, preparing costly brochures, participating in various CAB proceedings, waging an "all-out battle" for years in some instances to get air service—and then abandoning the infant service on its birthday. Certainly, if it was worth all the time, money, and effort to secure air service in the first place, it is equally worthwhile to exert even more of an effort to hold on to the air service when it is offered to the community on a trial basis.

There does not seem to be much question about the fact that those cities of the future which do not have scheduled air service will soon stagnate from a business point of view and lose their importance in the same manner of the communities just a hundred years ago which were bypassed by the railroads. "A city's economic health now depends to a considerable degree on its ability to accommodate aircraft safely and efficiently."† It is truly a sad thing when a community has had air service and has lost it be-

†Report from The President's Commission, May, 1952.

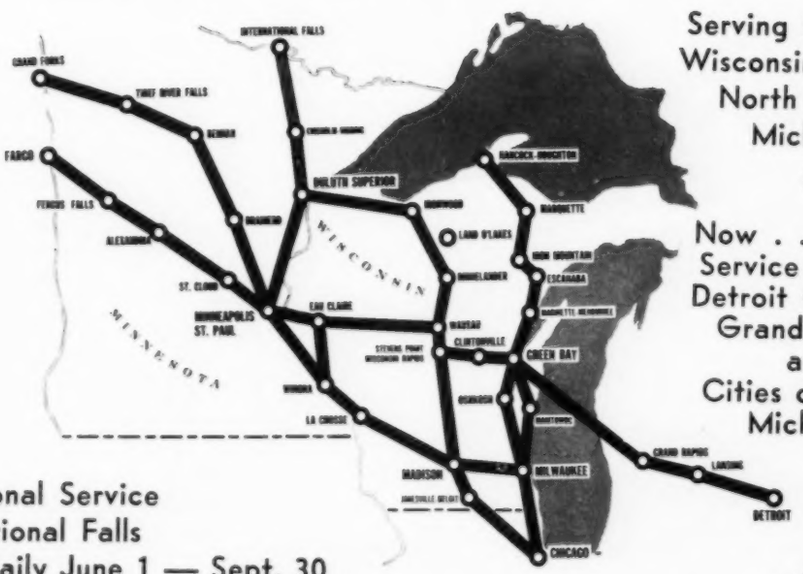


**Local Air Service and Community Welfare**

Urgently-needed emergency equipment such as iron lungs and hospital devices to ease suffering and save lives are quickly available to small communities through local service airlines. Such resources as this are seldom recognized until an emergency arises — unless emphasized and planned in regular community conferences. —(Frontier Airlines Photo.)


**We've changed our name from Wisconsin Central**

# to NORTH CENTRAL AIRLINES

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**DC-3 Passenger • Air Mail • Express • Parcel Post Service**

**COMMUNITY DEVELOPMENT THROUGH AIR CARGO** shipments can be accelerated through local air service. This is especially true in marketing fresh vegetables and produce along local service routes. A shipment of strawberries is being loaded in the scene above. —(Frontier Airlines Photo.)

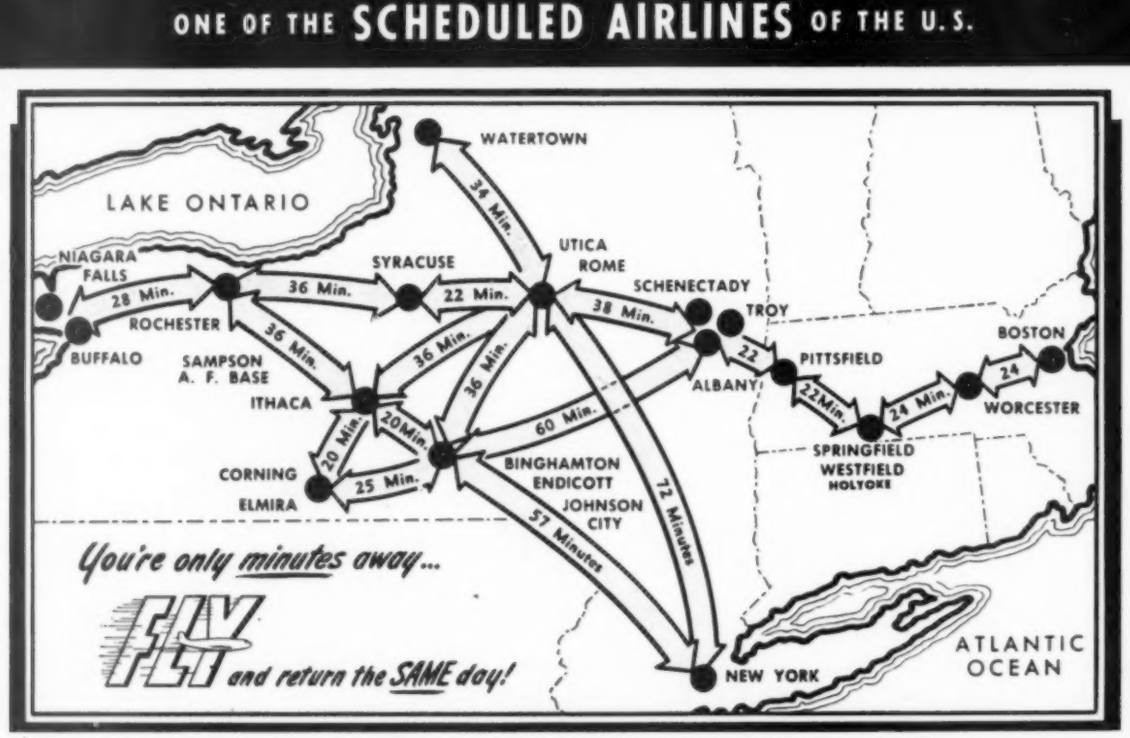
cause of its failure to patronize and promote the service. This job of promotion is not something which can be done by the communities alone or by the local service carrier alone, but by utilizing what we call "let-down-the-hair sessions" at regular intervals between representatives of the community and the local service airline a constructive program can be developed and implemented in most instances. These sessions, of course, must be based on hard facts—not on fancy.

### Fundamental Opportunities

There cannot be the attitude on the part of either the community or the carrier that the other is entirely at fault for the lack of business. Time should not be wasted with a long harangue of the history of what has happened before. Representatives of the communities must realize that *all the sincere civic pride and enthusiasm in the world will not, of itself, purchase a single ticket.* The carrier must realize that *people will not fly merely for the sake of flying and that the service must be in the direction and with a schedule pattern that has real utility if the service is to be patronized.*

These three fundamental problems —(1) the initial public acceptance of the local service airline as an important part of our air transportation picture, (2) the development of equitable charges based on the nature of the operation of this particular type air carrier, and (3) the recognition by large


MOHAWK AIRLINES
ONE OF THE SCHEDULED AIRLINES OF THE U.S.

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nd small communities of a clear-cut obligation to assist in the development of traffic for these new services—appear to be the primary problems confronting the local service airlines in relationship with the communities they serve. These three difficulties together cannot possibly be resolved without the development of a continuous, friendly, constructive, cooperative relationship between the communities and the local service airline.

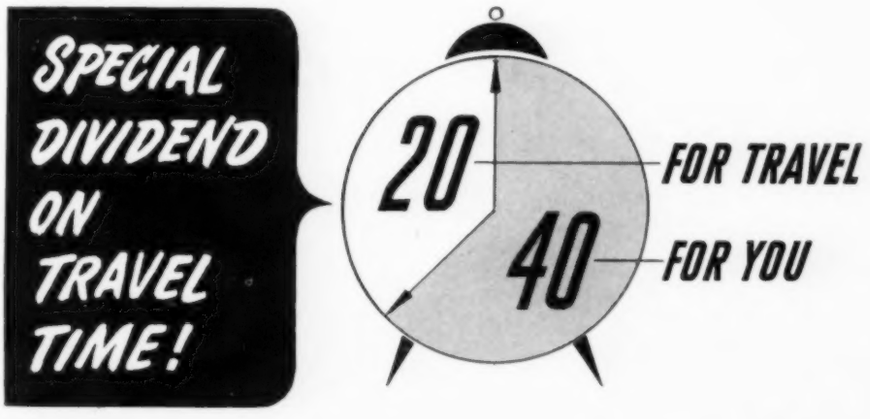
The tremendous progress made by the airline industry in speed, public acceptance, safety, and as an instrument for peace, which has now been extended to the grass roots level through our local service airlines, is changing our community life. All of these changes tend to make the relationship between the airlines and the community more important than ever before. Without a question, the future front door of our communities in peace or war is going to be our airports. For this reason it is extremely important that there be a mutual understanding and respect between the airlines and the communities toward each others problems.

### Local Cooperation Available

It has been our experience at the grass roots level that those relationships can be maintained at a high level by periodic "let-down-the-hair sessions" during which we meet with our communities, give an account of our stewardship, explain our problems and receive constructive suggestions as to how we may improve our service, reduce our cost, etc. In several of our states the directors of aviation have enabled us to put these meetings on a high plane, and we have sincerely appreciated their assistance.

In anticipation of our certificate renewal proceedings we are now in the process of completing a series of meetings with each of our communities during which we review our progress in the community since the commencement of operations. We believe, in all sincerity, that these meetings are mutually beneficial because we as an air carrier do not have the gift of telepathy; neither do the men in our cities charged with airport and air service development. If we can get together and "let down our hair," we as a carrier have a far better understanding of the city's airport problems and realistic schedule needs. The city then has a far better appreciation of our operating problems and is more aware of the service it actually has. Both the public and the air transportation industry benefit from improved service. Our only regret is that we have not been able to devote even more time to such sessions. In a small carrier with a limited staff where everyone functions as a one-man band it takes a real sacrifice to carry out a program of this type.

In all humility and sincerity we would like to propose to the air carriers and communities alike who read this article, that possibly one of the most effective methods, on either side of the fence, to improve local service airline-community relationships would be to inaugurate the practice of these "let-down-the-hair sessions" at regular intervals and *at other than negotiating sessions*. For example, most cities have an airport board of some type; most of these boards have periodic meetings. Would it not be helpful, logical, and constructive to invite the local service airline in to tell its story at one of your regular meetings at least once a year? Why should you extend such an invitation only when you have a "beef" about a schedule, or when you want to raise the landing fees or office rental? Meetings of this latter type, when both sides possibly have blood in their eyes, are not always conducive to constructive thinking. Why shouldn't the local airlines make it a point to meet for this purpose at least annually with their communities—not only when you are trying to secure community support for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On the ground, you would be one-third of the way to your destination at the same time that you *arrive there* by Pioneer. You actually save approximately 40 minutes out of every travel hour... when you fly Pioneer.

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a new route application or when you are trying to reduce airport charges.

Very few of our own cities have failed to appreciate our efforts in this regard. We have been received courteously and attentively, and we don't believe for a second that it was simply a one-way street. Our company through this means received a much better understanding and appreciation of our community relationships.

There is not a mysterious formula to be followed in solving these problems. It is obvious to all of us that the tremendous progress of the air transportation industry in speed, public acceptance, and safety which has been crammed into the 26 years just passed, is nothing compared to the developments just ahead. This progress and utility of the airplane will play an increasingly important part in our community life. The only way for both the local service airlines and the communities together to take full advantage of the opportunities offered is to eliminate the "iron curtain" that appears to exist in many instances between the community and the carrier.

Credit for whatever progress that has been made to date can be shared by the carriers and communities together. A return to the constructive type of thinking by the carriers and the communities that enabled this air transportation industry to get its start will result in some genuine progress as far as the local service airline industry is concerned with the result that it will pass its experimental stage and become a permanent, useful part of our vital air transportation system. ★ ★ ★

## JUST AMONG OURSELVES

*(Continued from page 13)*

a step-child of the Civil Aeronautics Board since the first experimental certificate of convenience and necessity was granted to Essair (now Pioneer Air Lines) back in 1943.

It's been ten years since the first temporary certificate was granted, yet even the most successful of the local service carriers are still on an "experimental" basis, still flying DC-3 airplanes, their executives still running back and forth to Washington 90 per cent of their time on mail rate, route and re-certification cases when they should be home trying to build up their non-mail revenues and cut costs. If the trunk airlines had been forced to establish their present systems under the terrific pressures and handicaps incident to local service operations, we dare say our air transportation system would be just about where it was fifteen years ago.

The time has come for the Congress and Civil Aeronautics Board, individually or collectively, to sit down and soberly re-appraise federal policy as regards bringing the benefits of air transportation to all our people. Such a re-appraisal must of necessity include military participation because it is impossible to put a dollars and cents value on the importance of strong operating small airlines as a national defense asset. If global war broke out tomorrow our air lift deficiency would probably be one of our most critical shortages — not steel, or oil or chemicals or production capacity. Many students of warfare logically wonder where the military services have been the past few years in the unproductive effort to get an efficient short-haul transport airplane, if only to help guarantee a going concern air transport complex maintained in constant readiness and subject to call on a few hours notice and consisting of planes, pilots, airports, mechanics, parts, supplies and overhaul bases which all the money in the world can't buy overnight.

There is nothing more ridiculous than placing a ceiling of $20 to $25 million in air mail pay subsidy annually to help develop local service air transportation unless it's the failure of this nation to develop a replacement airplane for the DC-3. Such a concept


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Southern Airways now adds convenient airline service north and south from Monroe, Louisiana, beginning June 13th. Southern's network of routes spans the South giving convenient airline transportation in 8 Southern states.

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merely drives nails into the coffin prior to lowering it into the grave. You can't put the air transportation needs of this country in that kind of straight-jacket, especially when the survival of the nation in a global war is involved.

Only during the past twelve months have straws in the Washington winds presaged evil days ahead for the extension of practical and realistic air service to all our citizens. The separation of mail pay from subsidy, the placing of a ceiling on how much will be spent to develop local service, the amazing language used in the now celebrated Pioneer "Martin 202" mail rate case, the completely ridiculous suggestion from Senator Johnson of Colorado to force the trunk airlines to take over operation of the local carriers, the year-in-year-out failure of Congress to push through prototype legislation, the strange silence in the military camp as regards the value of an expanded air transport industry in case of war with Russia — all of these adverse factors rise up to threaten every historical and legal precedent this nation has followed for more than two decades in establishing our present air transportation system.

It appears now there is only one solution to the simple problem of whether we are to expand or contract our domestic system of air transportation. If ALL the people want the benefits of air transportation then ALL the people must stand up and fight for it. Unless the smaller communities that now have local air service and those who hope to have it get on the ball, you can bet your bottom dollar the day is not far distant when the new philosophy jumps in the saddle and returns our air transportation system to a monopoly of the larger towns and to hell with all the rest. The "use-it-or-lose-it" idea is of course applicable in many cases of local service. But in the final analysis the power of the local communities on the Congress of the United States will determine the ultimate fate of an intelligently expanded air transport system or a gradual strangulation of the locals.

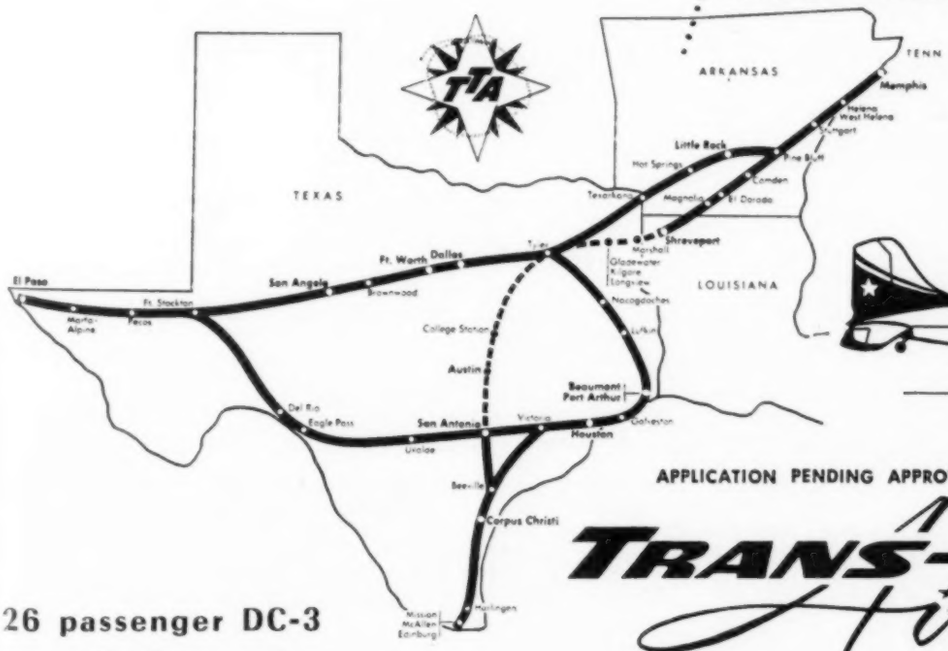
★ ★ ★

**BETTER METHODS CUT COSTS** of local air service equipment maintenance. Picture shows Buddy Anthonson of Mohawk Airlines using a special tool he developed to re-face fuel tank filler necks. This tool does the job in less than 1 hour, whereas conventional methods required 33 hours for the same job. Anthonson flies his own Piper Cub to and from work in the Mohawk maintenance hangar at Ithaca, N. Y. He lives 43 miles away.
—(Mohawk Airlines Photo.)

**LOCAL SERVICE AIRLINES**
**Comparison of Revenue Hours Flown**
**1951-1952**

| Carrier | 1951 | 1952 | % Increase |
|---|---|---|---|
| All American | 25,230 | 24,209 | (4.05) |
| Bonanza | 6,474 | 8,452 | 30.55 |
| Central | 10,776 | 12,643 | 17.33 |
| Empire | 8,856 | 5,034 | — |
| Frontier | 32,145 | 32,092 | (0.16) |
| Lake Central | 8,591 | 7,951 | (7.45) |
| Mid-West | 6,278 | 2,196 | — |
| Mohawk | 11,265 | 14,535 | 29.03 |
| Ozark | 14,901 | 19,047 | 27.82 |
| Piedmont | 27,549 | 33,743 | 22.48 |
| Pioneer | 27,095 | 22,892 | (15.51) |
| Southern | 20,425 | 22,360 | 9.47 |
| Southwest | 19,795 | 21,209 | 7.14 |
| Trans-Texas | 20,147 | 18,765 | (6.86) |
| West Coast | 10,157 | 15,848 | 56.03 |
| Wiggins | 4,548 | 3,655 | (19.64) |
| Wisc. Central | 14,051 | 18,635 | 32.62 |
| Total | 268,283 | 283,266 | 5.58 |


*Welcome Aboard* for 11 new cities in Arkansas, Tennessee and Louisiana




*one of the outstanding local service carriers in the nation . . .*

APPLICATION PENDING APPROVAL

**TRANS-TEXAS Airways**

**26 passenger DC-3 super Starliner service**

## Statistical Analysis of Local Serv

| | All American | Bonanza | Central | Empire | Frontier | Lake Central | Mid-West |
|---|---|---|---|---|---|---|---|
| **OPERATING REVENUES (Dollars):** | | | | | | | |
| Passenger | 1,643,091 | 612,397 | 363,277 | 269,133 | 1,711,487 | 295,487 | 5,692 |
| U. S. Mail | 1,944,820 | 694,720 | 1,493,827 | 346,527 | 2,900,934 | 949,225 | 121,647 |
| Other | 167,105 | 36,356 | (48,946) | 23,757 | 224,998 | 54,685 | 95 |
| Total Revenue | 3,755,016 | 1,343,473 | 1,808,158 | 639,417 | 4,837,419 | 1,299,397 | 127,434 |
| **OPERATING EXPENSES (Dollars):** | | | | | | | |
| Flying Operations | 1,126,522 | 358,359 | 525,034 | 236,000 | 1,514,095 | 336,488 | 37,586 |
| Maintenance Flight Equipment | 471,425 | 215,543 | 276,467 | 70,056 | 482,144 | 237,482 | 16,709 |
| Depreciation Flight Equipment | 227,855 | 41,643 | 149,574 | 17,670 | 191,556 | 37,240 | 0 |
| Total Direct Expense | 1,825,802 | 615,545 | 951,075 | 323,726 | 2,187,795 | 611,210 | 54,295 |
| Ground Operations | 654,514 | 235,422 | 359,111 | 116,862 | 918,439 | 273,517 | 29,105 |
| Maint.—Ground and Indirect | 300,464 | 145,434 | 204,917 | 42,437 | 313,467 | 81,337 | 3,487 |
| Passenger Service | 151,861 | 56,682 | 73,085 | 26,083 | 231,924 | 43,892 | 36 |
| Traffic and Sales | 531,579 | 109,842 | 232,238 | 52,063 | 417,896 | 126,472 | 31,788 |
| Advertising, Publicity | 92,488 | 32,969 | 41,676 | 9,425 | 153,416 | 28,817 | 64 |
| Gen. and Administrative | 271,641 | 154,715 | 245,844 | 45,307 | 420,599 | 173,305 | 32,466 |
| Depreciation—Ground | 45,995 | 35,974 | 31,981 | 6,845 | 49,738 | 10,578 | 221 |
| Total Indirect Expense | 2,048,542 | 771,038 | 1,188,852 | 299,022 | 2,505,479 | 737,918 | 97,167 |
| Total Operating Expense | 3,874,344 | 1,386,583 | 2,139,927 | 622,748 | 4,693,274 | 1,349,128 | 151,462 |
| Break-Even Need | 2,064,148 | 737,830 | 1,825,596 | 329,858 | 2,756,789 | 998,956 | 145,675 |
| **CENTS PER REVENUE MILE FLOWN** | | | | | | | |
| **Operating Revenues:** | | | | | | | |
| Passenger | 50.97 | 49.90 | 21.30 | 36.79 | 36.81 | 26.61 | 2.16 |
| U. S. Mail | 60.33 | 56.61 | 87.57 | 47.38 | 62.40 | 85.36 | 46.10 |
| Other | 5.18 | 2.96 | (2.87) | 3.25 | 4.84 | 4.88 | 0.03 |
| Total Revenue | 116.48 | 109.47 | 106.00 | 87.42 | 104.05 | 116.85 | 48.29 |
| **Operating Expenses:** | | | | | | | |
| Flying Operations | 34.95 | 29.20 | 30.78 | 32.26 | 32.57 | 30.26 | 14.25 |
| Maintenance Flight Equipment | 14.62 | 17.56 | 16.21 | 9.58 | 10.37 | 21.36 | 6.33 |
| Depreciation Flight Equipment | 7.07 | 3.39 | 8.77 | 2.42 | 4.12 | 3.35 | 0.00 |
| Total Direct Expense | 56.64 | 50.15 | 55.76 | 44.26 | 47.06 | 54.97 | 20.58 |
| Ground Operations | 20.30 | 19.18 | 21.05 | 15.98 | 19.75 | 24.60 | 15.98 |
| Maint.—Ground and Indirect | 9.32 | 11.85 | 12.01 | 5.80 | 6.74 | 7.31 | 5.80 |
| Passenger Service | 4.71 | 4.62 | 4.28 | 3.56 | 4.99 | 3.95 | 3.56 |
| Traffic and Sales | 16.49 | 8.95 | 13.62 | 7.12 | 8.99 | 11.37 | 7.12 |
| Advertising, Publicity | 2.87 | 2.69 | 2.44 | 1.29 | 3.30 | 2.59 | 1.29 |
| Gen. and Administrative | 8.43 | 12.61 | 14.41 | 6.19 | 9.05 | 15.59 | 6.19 |
| Depreciation—Ground | 1.43 | 2.93 | 1.88 | 0.94 | 1.07 | 0.95 | 0.94 |
| Total Indirect Expense | 63.55 | 62.83 | 69.69 | 40.88 | 53.89 | 66.36 | 40.88 |
| Total Operating Expense | 120.19 | 112.98 | 125.45 | 85.14 | 100.95 | 121.33 | 85.14 |
| Break-Even Need | 64.04 | 60.12 | 107.02 | 45.10 | 59.30 | 89.84 | 45.10 |
| **CENTS PER REVENUE TON-MILE:** | | | | | | | |
| Non-Mail Revenue | 65.05 | 60.01 | 44.51 | 52.95 | 48.91 | 60.82 | 52.95 |
| Mail Revenue | 69.89 | 64.27 | 211.53 | 62.64 | 73.28 | 164.88 | 62.64 |
| Total Revenue | 134.95 | 124.28 | 256.04 | 115.59 | 122.19 | 225.70 | 115.59 |
| Direct Flight Expense | 65.62 | 56.94 | 134.67 | 58.52 | 55.26 | 106.17 | 58.52 |
| Indirect Expense | 73.62 | 71.33 | 168.34 | 54.06 | 63.29 | 128.17 | 54.06 |
| Total Expense | 139.24 | 128.27 | 303.01 | 112.58 | 118.55 | 234.34 | 112.58 |
| **PASSENGERS CARRIED** | | | | | | | |
| Per Employe | 388 | 235 | 181 | 245 | 234 | 206 | 19 |
| Per Airplane | 15,332 | 10,926 | 7,861 | 5,723 | 10,617 | 8,303 | 173 |
| **TON-MILES CARRIED:** | | | | | | | |
| Per Employe | 5,870 | 5,812 | 2,706 | 4,728 | 7,264 | 3,576 | 311 |
| Per Airplane | 231,872 | 270,254 | 117,703 | 110,634 | 329,908 | 143,930 | 2,795 |
| Average Passenger Trip Length—Miles | 146 | 246 | 142 | 196 | 267 | 165 | 196 |
| Average Passenger Fare Paid (Dollars) | 9.13 | 14.15 | 7.74 | 9.74 | 13.63 | 9.02 | 6.57 |
| Average Revenue Per Passenger-Mile—Cents | 6.39 | 5.77 | 5.67 | 5.00 | 5.19 | 5.75 | 4.45 |
| Passengers Per 1,000 Population Served | 12 | 17 | 28 | 68 | 96 | 6 | 1 |
| **ROUTE PATTERN DATA OPERATED AS OF DECEMBER 31, 1952** | | | | | | | |
| Unduplicated Route Miles | 2,062 | 1,309 | 1,198 | 953 | 3,550 | 632 | 1,230 |
| Number of Stations | 31 | 15 | 22 | 16 | 37 | 11 | 24 |
| Number of Exclusive Local Service Stations | 15 | 10 | 12 | 9 | 22 | 4 | 13 |
| Daily Route Mile Turnover | 5.73 | 3.82 | 4.36 | 4.55 | 4.68 | 4.55 | 1.58 |
| Months in Operation to Dec. 31, 1952 | 45 | 36 | 39 | 70 | 73 | 38 | 30 |
| Number of Employes | 474 | 186 | 261 | 117 | 545 | 161 | 45 |
| Landings Per Day | 140 | 33 | 88 | 58 | 140 | 44 | 35 |
| **SELECTED OPERATING STATISTICS:** | | | | | | | |
| Revenue Miles Flown | 3,223,623 | 1,227,264 | 1,705,856 | 731,439 | 4,649,008 | 1,111,961 | 263,864 |
| Revenue Hours Flown | 24,209 | 8,452 | 12,643 | 5,034 | 32,092 | 7,951 | 2,196 |
| Schedule Completion Factor | 92.26 | 97.81 | 97.73 | 98.77 | 98.38 | 94.16 | 78.80 |
| Number of Aircraft Scheduled | 12 | 4 | 6 | 5 | 12 | 4 | 5 |
| Revenue Passenger Miles (000) | 26,798 | 10,751 | 6,689 | 5,622 | 34,025 | 5,481 | 128 |
| Revenue Passenger Load Factor | 39.59 | 41.71 | 18.67 | 36.60 | 34.85 | 24.29 | 12.13 |
| Average Passenger Load | 8.31 | 8.76 | 3.92 | 7.69 | 7.32 | 4.93 | 0.49 |
| **REVENUE TON-MILES FLOWN:** | | | | | | | |
| Passenger | 2,590,217 | 1,019,732 | 636,934 | 525,394 | 3,340,389 | 502,460 | 10,541 |
| U. S. Mail | 63,071 | 16,563 | 33,001 | 14,929 | 109,740 | 15,495 | 3,406 |
| Express | 118,638 | 11,514 | 11,497 | 9,824 | 72,666 | 51,979 | ..... |
| Freight | 0 | 26,180 | 22,690 | ..... | 420,358 | 3,017 | ..... |
| Excess Baggage | 10,534 | 7,028 | 2,093 | 3,024 | 15,743 | 2,770 | 28 |
| Total | 2,782,460 | 1,081,017 | 706,215 | 553,171 | 3,958,896 | 575,721 | 13,975 |
| Revenue Ton-Mile Load Factor | 35.96 | 36.70 | 17.25 | 31.51 | 35.48 | 22.22 | 12.04 |
| Revenue Passengers Carried | 183,986 | 43,705 | 47,167 | 28,617 | 127,398 | 33,213 | 866 |
| Tons Revenue Express and Freight | 887 | 186 | 219 | 52 | 1,549 | 398 | ..... |
| Daily Aircraft Utilization | 5:31 | 5:47 | 6:03 | 4:43 | 7:18 | 4:27 | 2:41 |
| Average Flying Speed | 133.6 | 145.6 | 141.6 | 145.3 | 144.9 | 140.5 | 120.2 |
| Revenue Ton-Mile Per Revenue Mile | 0.86 | 0.88 | 0.41 | 0.76 | 0.85 | 0.52 | 0.05 |

NOTE: All American is now Allegheny and Wisconsin-Central is now North Central.

## ervice Airline Operations for 1952

| Mohawk | Ozark | Piedmont | Pioneer | Southern | Southwest | Trans-Texas | West Coast | Wiggins | Wisconsin Central | Total or Average |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,153,784 | 805,597 | 3,087,249 | 2,849,924 | 1,181,779 | 1,727,621 | 951,675 | 1,023,247 | 19,822 | 1,470,536 | 19,171,798 |
| 907,151 | 2,163,091 | 1,278,919 | 1,295,337 | 1,859,104 | 1,031,734 | 1,640,806 | 552,511 | 289,180 | 1,681,541 | 21,151,074 |
| 133,216 | 38,889 | 141,097 | 155,721 | 62,305 | 123,714 | 142,172 | 65,953 | 7,421 | 71,001 | 1,399,539 |
| 2,194,151 | 3,007,577 | 4,507,265 | 4,300,982 | 3,103,188 | 2,883,069 | 2,734,653 | 1,641,711 | 316,423 | 3,223,078 | 41,722,411 |
| 693,226 | 879,726 | 1,512,740 | 1,465,697 | 1,016,958 | 889,930 | 863,456 | 668,388 | 72,096 | 910,779 | 13,107,080 |
| 288,974 | 300,305 | 586,721 | 720,029 | 451,798 | 220,766 | 323,591 | 175,726 | 27,359 | 483,292 | 5,348,387 |
| 122,054 | 332,831 | 150,314 | 307,654 | 144,732 | 95,581 | 24,790 | 49,642 | 10,311 | 167,036 | 2,070,483 |
| 1,104,254 | 1,512,862 | 2,249,775 | 2,493,380 | 1,613,488 | 1,206,277 | 1,211,837 | 893,756 | 109,766 | 1,561,107 | 20,525,950 |
| 305,704 | 429,413 | 519,033 | 637,958 | 481,918 | 520,901 | 407,961 | 387,309 | 110,646 | 631,215 | 7,019,028 |
| 165,189 | 227,203 | 238,876 | 237,088 | 254,227 | 201,563 | 269,434 | 99,349 | 14,997 | 288,406 | 3,087,875 |
| 95,008 | 112,453 | 220,826 | 240,000 | 146,051 | 146,108 | 117,010 | 88,240 | 1,433 | 137,652 | 1,888,344 |
| 181,363 | 275,752 | 635,476 | 539,859 | 420,753 | 324,758 | 349,315 | 214,340 | 10,601 | 313,470 | 4,767,565 |
| 41,264 | 25,608 | 162,746 | 165,850 | 66,352 | 86,498 | 84,027 | 68,608 | 3,086 | 60,030 | 1,122,924 |
| 198,168 | 264,748 | 275,863 | 324,362 | 242,575 | 227,282 | 231,863 | 168,853 | 42,743 | 277,637 | 3,597,971 |
| 29,910 | 36,670 | 25,805 | 52,043 | 31,287 | 27,026 | 29,809 | 17,977 | 2,580 | 38,157 | 472,596 |
| 1,016,606 | 1,371,847 | 2,078,625 | 2,197,160 | 1,643,163 | 1,534,136 | 1,489,419 | 1,044,676 | 186,086 | 1,746,567 | 21,956,303 |
| 2,120,860 | 2,884,709 | 4,328,400 | 4,690,540 | 3,256,651 | 2,740,413 | 2,701,256 | 1,938,432 | 295,852 | 3,307,674 | 42,482,253 |
| 833,860 | 2,040,223 | 1,100,054 | 1,684,895 | 2,012,567 | 889,078 | 1,607,409 | 849,232 | 268,609 | 1,766,137 | 21,910,916 |
| 58.02 | 30.05 | 61.41 | 74.03 | 35.39 | 63.60 | 34.18 | 48.78 | 4.60 | 51.28 | 47.11 |
| 45.62 | 81.67 | 25.44 | 33.65 | 55.67 | 37.98 | 58.94 | 26.32 | 67.17 | 58.64 | 51.97 |
| 6.70 | 1.45 | 2.81 | 4.04 | 1.86 | 4.55 | 5.11 | 3.10 | 1.72 | 2.48 | 3.44 |
| 110.34 | 112.17 | 89.66 | 111.72 | 92.92 | 106.13 | 98.23 | 78.20 | 73.49 | 112.40 | 102.52 |
| 34.86 | 32.81 | 30.09 | 38.07 | 30.45 | 32.76 | 31.02 | 31.84 | 16.75 | 31.76 | 32.21 |
| 14.53 | 11.20 | 11.67 | 18.71 | 13.53 | 8.13 | 11.62 | 8.37 | 6.35 | 16.85 | 13.14 |
| 6.14 | 12.41 | 2.99 | 7.99 | 4.33 | 3.52 | 0.89 | 2.36 | 2.39 | 5.83 | 5.09 |
| 55.53 | 56.42 | 44.75 | 64.77 | 48.31 | 44.41 | 43.53 | 42.57 | 25.49 | 54.44 | 50.44 |
| 15.37 | 16.02 | 10.33 | 16.57 | 14.43 | 19.18 | 14.65 | 18.45 | 25.70 | 20.01 | 17.25 |
| 8.31 | 8.47 | 4.75 | 6.16 | 7.61 | 7.42 | 9.68 | 4.73 | 3.48 | 10.06 | 7.59 |
| 4.78 | 4.20 | 4.39 | 6.23 | 4.37 | 5.38 | 4.20 | 4.20 | 0.33 | 4.80 | 4.64 |
| 9.12 | 10.28 | 12.64 | 14.02 | 12.60 | 11.95 | 12.55 | 10.21 | 2.46 | 10.93 | 11.71 |
| 2.08 | 0.96 | 3.24 | 4.31 | 1.99 | 3.18 | 3.02 | 3.27 | 0.72 | 2.10 | 2.76 |
| 9.97 | 9.87 | 5.49 | 8.43 | 7.26 | 8.37 | 8.33 | 8.04 | 9.93 | 9.68 | 8.84 |
| 1.50 | 1.37 | 0.51 | 1.35 | 0.94 | 0.99 | 1.07 | 0.86 | 0.60 | 1.33 | 1.16 |
| 51.13 | 51.17 | 41.35 | 57.07 | 49.20 | 56.47 | 53.50 | 49.76 | 43.22 | 60.91 | 53.95 |
| 106.66 | 107.59 | 86.10 | 121.84 | 97.51 | 100.88 | 97.03 | 92.33 | 68.71 | 115.35 | 104.39 |
| 41.94 | 76.09 | 21.88 | 43.77 | 60.26 | 32.73 | 57.74 | 40.45 | 62.39 | 61.59 | 53.84 |
| 68.64 | 58.88 | 62.59 | 58.61 | 57.34 | 56.03 | 55.52 | 61.78 | 87.42 | 58.72 | 58.55 |
| 48.38 | 150.83 | 24.80 | 25.26 | 85.68 | 31.22 | 83.28 | 31.34 | 927.93 | 64.06 | 60.21 |
| 117.02 | 209.71 | 87.39 | 83.87 | 143.02 | 87.25 | 138.80 | 93.12 | 1,015.35 | 122.78 | 118.76 |
| 58.89 | 105.49 | 43.62 | 48.62 | 74.36 | 36.50 | 61.51 | 50.70 | 352.22 | 59.47 | 58.43 |
| 54.22 | 95.65 | 40.30 | 42.84 | 75.73 | 46.43 | 75.59 | 59.26 | 597.12 | 66.53 | 62.50 |
| 113.11 | 201.14 | 83.92 | 91.46 | 150.09 | 82.93 | 137.10 | 109.96 | 949.34 | 126.00 | 120.93 |
| 442 | 223 | 374 | 408 | 262 | 465 | 213 | 400 | 91 | 314 | 317 |
| 13,814 | 10,558 | 17,285 | 20,363 | 13,486 | 18,340 | 7,821 | 13,050 | 636 | 15,307 | 13,106 |
| 7,500 | 3,784 | 8,582 | 11,422 | 4,686 | 9,308 | 5,354 | 6,452 | 890 | 5,379 | 6,537 |
| 234,382 | 179,286 | 396,742 | 569,818 | 241,091 | 367,168 | 197,025 | 210,555 | 6,233 | 262,517 | 270,235 |
| 174 | 167 | 224 | 267 | 172 | 190 | 235 | 162 | 98 | 165 | 198 |
| 10.86 | 9.54 | 13.77 | 15.65 | 9.76 | 10.52 | 12.36 | 9.02 | 6.44 | 9.61 | 11.37 |
| 6.37 | 5.70 | 6.15 | 5.47 | 5.72 | 5.55 | 5.56 | 5.58 | 7.34 | 5.83 | 5.75 |
| 11 | 12 | 84 | 88 | 38 | 44 | 37 | 97 | 1 | 26 | 38 |
| 1,019 | 1,858 | 2,197 | 1,932 | 2,134 | 1,153 | 2,141 | 2,156 | 841 | 2,250 | 27,475 |
| 10 | 28 | 25 | 20 | 32 | 26 | 26 | 31 | 15 | 28 | 353 |
| 2 | 11 | 7 | 9 | 13 | 21 | 15 | 19 | 7 | 22 | 201 |
| 9.72 | 4.12 | 9.40 | 7.87 | 4.58 | 7.02 | 4.27 | 5.69 | 2.47 | 5.28 | 5.27 |
| 51 | 27 | 58 | 89 | 43 | 72 | 63 | 72 | 38 | 58 | 53 |
| 250 | 379 | 601 | 449 | 463 | 355 | 368 | 359 | 35 | 488 | 5,419 |
| 66 | 98 | 154 | 117 | 137 | 124 | 97 | 92 | 25 | 105 | 1,553 |
| 1,988,489 | 2,681,276 | 5,026,904 | 3,849,793 | 3,339,729 | 2,716,503 | 2,784,011 | 2,099,356 | 430,545 | 2,867,727 | 40,697,348 |
| 14,535 | 19,047 | 33,743 | 22,892 | 22,360 | 21,209 | 18,765 | 15,848 | 3,655 | 18,635 | 283,266 |
| 94.80 | 94.38 | 98.55 | 97.70 | 98.50 | 96.67 | 98.04 | 94.59 | 75.01 | 91.53 | 95.95 |
| 8 | 8 | 13 | 9 | 9 | 9 | 10 | 11 | 5 | 10 | 130 |
| 19,220 | 14,147 | 50,435 | 48,886 | 20,820 | 31,331 | 18,361 | 18,674 | 313 | 25,238 | 336,919 |
| 46.03 | 25.12 | 47.78 | 44.12 | 29.69 | 54.92 | 31.41 | 42.36 | 18.82 | 41.91 | 38.64 |
| 9.67 | 5.28 | 10.03 | 12.70 | 6.23 | 11.53 | 6.60 | 8.90 | 0.73 | 8.80 | 8.28 |
| 1,737,341 | 1,315,544 | 4,791,308 | 4,757,064 | 1,979,944 | 3,046,594 | 1,788,069 | 1,674,670 | 28,247 | 2,380,611 | 32,125,059 |
| 34,005 | 40,578 | 85,823 | 125,893 | 86,387 | 84,432 | 63,684 | 20,254 | 1,100 | 94,696 | 893,057 |
| 57,472 | 70,331 | 95,688 | 44,197 | 88,403 | 44,406 | 30,707 | 19,082 | 1,781 | 138,341 | 866,526 |
| 42,310 | ..... | 147,652 | 177,045 | ..... | 117,784 | 81,686 | 42,597 | ..... | ..... | 1,081,319 |
| 3,932 | 7,698 | 37,177 | 24,162 | 15,085 | 11,297 | 6,101 | 6,329 | 36 | 11,526 | 164,563 |
| 1,875,060 | 1,434,151 | 5,157,648 | 5,128,361 | 2,169,819 | 3,304,513 | 1,970,247 | 1,762,932 | 31,164 | 2,625,174 | 35,130,524 |
| 39.29 | 22.29 | 42.75 | 44.85 | 27.07 | 50.69 | 29.49 | 34.99 | 17.56 | 38.14 | 35.64 |
| 110,514 | 84,463 | 224,702 | 183,271 | 121,375 | 165,057 | 78,214 | 114,937 | 3,178 | 153,067 | 1,703,730 |
| 640 | 451 | 1,004 | 730 | 436 | 929 | 445 | 365 | 46 | 833 | 9,170 |
| 5:31 | 6:30 | 7:59 | 6:22 | 6:21 | 6:24 | 5:30 | 5:21 | 2:00 | 6:33 | 95:01 |
| 136.7 | 140.5 | 149.0 | 169.7 | 149.4 | 128.1 | 148.4 | 132.5 | 117.4 | 153.9 | 143.7 |
| 0.94 | 0.53 | 1.03 | 1.33 | 0.65 | 1.22 | 0.71 | 0.84 | 0.07 | 0.92 | 0.86 |

—From CAB Reports, Compiled by Ray and Ray, Consultants.

## Local Service Airlines Growth, 1950-1951-1952

(Comparative Operating Statistics for Each Year)

| | 1949 | 1950 | 1951 | 1952 |
|---|---|---|---|---|
| Revenue Plane Miles | 23,994,931 | 33,593,736 | 37,797,136 | 40,697,348 |
| Number of Revenue Passengers | 683,811 | 987,931 | 1,462,083 | 1,703,730 |
| Revenue Passenger Miles (000) | 136,560 | 200,903 | 291,296 | 336,919 |
| Available Seat Miles (000) | 479,663 | 607,508 | 762,542 | 871,947 |
| Revenue Passenger Load Factor | 28.47 | 33.07 | 38.20 | 38.64 |
| Mail Ton-Miles | 432,628 | 559,085 | 765,456 | 893,057 |
| Express Ton-Miles | 320,143 | 614,139 | 864,946 | 886,526 |
| Freight Ton-Miles | 435,993 | 714,346 | 884,417 | 1,081,319 |
| Total Revenue Ton-Miles (000) | 14,328 | 21,480 | 30,709 | 35,131 |
| Available Ton-Miles (000) | 53,648 | 69,380 | 87,003 | 98,419 |
| Revenue Ton-Mile Load Factor | 26.71 | 30.96 | 35.30 | 35.69 |

## Local Service Airlines Revenue Growth, 1946-1952

| Year | Passengers | Per Cent of Total | Mail | Per Cent of Total | Express and Freight | Per Cent of Total | Other | Per Cent of Total |
|---|---|---|---|---|---|---|---|---|
| 1946 | $ 314,638 | 16.29 | $ 1,558,614 | 80.71 | $ 13,008 | 0.67 | $ 44,797 | 2.22 |
| 1947 | 2,280,124 | 26.99 | 5,057,097 | 70.51 | 60,179 | 0.71 | 150,931 | 1.79 |
| 1948 | 4,666,549 | 28.64 | 11,282,490 | 69.25 | 147,159 | 0.91 | 195,511 | 1.20 |
| 1949 | 7,362,007 | 33.55 | 14,054,998 | 64.88 | 252,159 | 1.11 | 271,466 | 1.23 |
| 1950 | 10,302,859 | 36.94 | 16,384,321 | 58.74 | 442,046 | 1.58 | 763,718 | 2.74 |
| 1951 | 15,757,569 | 43.86 | 18,575,430 | 51.71 | 629,886 | 1.75 | 962,801 | 2.68 |
| 1952 | 19,171,798 | 45.95 | 21,151,074 | 50.70 | 593,661 | 1.42 | 805,878 | 1.93 |

## LOCAL SERVICE PROGRESS

*(Continued from page 23)*

the accompanying charts and graphs will show. The carriers had an accident-free year. The quality of their service improved noticeably. Schedules were flown with greater reliability and on-time performance far above preceding years.

One of the outstanding accomplishments in 1952 was the very definite improvement in the local service airlines' individual organizations. They trained more personnel and placed them in key positions that had been neglected. They improved accounting practices and record keeping. They tightened up all along the line and laid the groundwork for economies and more efficient operations in all departments. As one observer put it, "the locals grew up in 1952."

Many of the companies refinished the interiors of their aircraft, improved the outside appearance of the planes with cleansers and paint, spruced up their ramp equipment and operations, and some increased their DC-3 seating capacity beyond the 21 conventional seats. All of these internal company improvements contributed some to the 1952 costs but no one will deny that the benefits from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such sound business practices will pay out in the years to come. Already the few figures available for 1953 definitely reveal that there's been a substantial increase in traffic over the first quarter of 1952.

Community relations improved considerably. The carriers devoted more time and energy to sales promotional efforts in all the communities served, bearing down on the principle that air service to the marginal communities was the main root of all subsidy. Too often many communities don't appreciate air service until they lose it as the towns along abandoned routes can well testify. A hard-working practical partnership between communities and the carriers will alone bring local air service into its full potential.

Significant developments in local air service during 1952 included full flowering of interline exchange of passengers between locals and trunks. Over half the passengers riding local airlines represented inter-line travel. Revenue to trunk airlines from the "feeders" totaled more than $19,000,000—but revenue to the locals from the trunks came to less than half that amount, being just under $9,000,000. Thus the locals are proving themselves to be "feeder" airlines in the literal sense of the term.

The locals are serving 212,430 population less than a year ago, due chiefly to suspension of operations by Mid-West—but at cities receiving local service only, the small carriers are serving 449,781 more people than in 1951.

In 1952, average passenger loads were up 7.5 per cent, total mail carried increased 16.67 per cent, revenue passenger miles picked up 15.66 per cent, and number of revenue passengers gained 16.53 per cent.

Better service by local carriers is indicated in the fact that the 14 operators averaged 5.27 trips per day during 1952 as against 4.25 in 1951. This improvement in schedule frequency was especially noticeable in reports from two local carriers which have made outstanding progress—Piedmont, which averaged 9.40 trips daily as compared to 6.95 previously, and Mohawk, which averaged 9.72 trips daily as against only 5.61 in 1951.

*(Continued on page 56)*

## Local Service Airlines Operating Expenses, 1946-1952

| Year | Aircraft Operating Expenses | Per Cent of Total | Ground and Indirect Expenses | Per Cent of Total | Total Operating Expenses |
|---|---|---|---|---|---|
| 1946 | $ 999,175 | 48.49 | $ 1,064,254 | 51.65 | $ 2,060,429 |
| 1947 | 4,462,227 | 49.20 | 4,607,078 | 50.80 | 9,069,305 |
| 1948 | 8,321,371 | 52.26 | 7,602,141 | 47.74 | 15,923,512 |
| 1949 | 11,810,777 | 52.77 | 10,570,938 | 47.23 | 22,381,715 |
| 1950 | 13,453,647 | 49.25 | 13,863,096 | 50.75 | 27,316,743 |
| 1951 | 16,515,791 | 47.11 | 18,541,583 | 52.89 | 35,057,373 |
| 1952 | 20,525,950 | 48.32 | 21,956,303 | 51.68 | 42,482,253 |

## Local Service Airlines Direct Operating Expenses, 1946-1952

| Year | Flying Operations | Per Cent of Total | Dir. Maint. Flight Equipment | Per Cent of Total | Depreciation Flight Equipment | Per Cent of Total |
|---|---|---|---|---|---|---|
| 1946 | $ 497,438 | 24.14 | $ 347,727 | 16.88 | $ 151,010 | 7.33 |
| 1947 | 2,203,155 | 24.29 | 1,336,677 | 14.74 | 922,395 | 10.17 |
| 1948 | 4,526,827 | 28.43 | 2,348,309 | 14.75 | 1,446,234 | 9.08 |
| 1949 | 6,486,969 | 28.91 | 3,280,965 | 14.66 | 2,042,843 | 9.13 |
| 1950 | 8,482,742 | 31.05 | 3,476,759 | 12.73 | 1,494,146 | 5.47 |
| 1951 | 10,684,089 | 30.48 | 4,216,070 | 12.02 | 1,615,632 | 4.61 |
| 1952 | 13,107,080 | 30.85 | 5,348,387 | 12.59 | 2,070,483 | 4.88 |

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LOOK TO LOCKHEED FOR LEADERSHIP

## CAB TRENDS

*(Continued from page 33)*

"The foregoing analysis is made not for the purpose of proving that Safford, Clifton or Silver City have great potential strength as traffic generating points, because the record indicates the contrary. It does show, however, that these communities have made, and give promise of continuing to make considerably greater use of the air transportation provided them by Frontier than have Lordsburg, Deming and Las Cruces. We believe that a further period of time to become accustomed to use of air service and an improved service, including a connection with Tucson . . . should result in an increase in traffic at the latter communities and at Silver City to the point where the public benefits from the service provided will warrant its cost to the Government . . ."

### Locals Strengthened with Points From Trunks

The Board is of the opinion that duplication of service at such communities by both a trunkline and a local service carrier proves harmful to both carriers, that the operation of both services is uneconomic, and that in some cases exclusive service by the local service carrier will often provide greater scheduling convenience and financial benefit to the carrier. Therefore, toward the end of eliminating uneconomic duplicating services, and toward the strengthening of the local service operation, the Board has, in the past year, considered the suspension, nonrenewal, or termination of trunkline service at 34 communities, in favor of local service at those points. In evaluating the worth of such suspensions, the Board has taken into account three principal factors:

(1) The public convenience,
(2) The gain or loss to the trunkline from its possible suspension, and
(3) The gain or cost to the local service carrier.

On the balance of these three considerations as related to the 34 cities, the Board decided in favor of trunkline suspension at 17 cities, and against such suspension at 17 cities.

In discussing its decision to suspend the trunk service of American Airlines at Erie, Pennsylvania, in favor of Allegheny Airlines, the Board said:[4]

". . . If All American (Allegheny) were to substitute for American at Erie, there would be an almost insignificant reduction in existing one-plane service for Erie traffic. On the basis of the traffic reported in September, 1950, less than one passenger a day in each direction would be required to use a connecting service in place of the one-plane service. To be set off against this, there would be greater frequencies daily by the local carrier . . .

"The city urges approval of the All American proposal which would provide service to Cleveland, on the one hand, and to Harrisburg, Bradford, Williamsport, and New York, on the other . . .

"Erie's complaint that it does not receive sufficient westbound service to Cleveland cannot be ignored; yet American, with its eye on the long-haul traveller, cannot be expected to provide Erie with a greater frequency than that currently operated. American

**LOCAL SERVICE AIRLINES**
**Comparison of Total Operating Expenses**
**(Cents Per Revenue Mile)**

| Carrier | 1951 | 1952 |
|---|---|---|
| All American | 112.23 | 120.19 |
| Bonanza | 111.89 | 112.98 |
| Central | 111.08 | 125.45 |
| Empire | 81.51 | 85.14 |
| Frontier | 91.41 | 100.95 |
| Lake Central | 91.20 | 121.33 |
| Mid-West | 49.16 | 57.40 |
| Mohawk | 103.33 | 106.66 |
| Ozark | 111.26 | 107.59 |
| Piedmont | 81.17 | 86.10 |
| Pioneer | 83.08 | 121.84* |
| Southern | 90.86 | 97.51 |
| Southwest | 93.10 | 100.88 |
| Trans-Texas | 88.26 | 97.03 |
| West Coast | 85.41 | 92.33 |
| Wiggins | 57.63 | 68.71 |
| Wisc. Central | 106.31 | 115.34 |
| Average** | 92.75 | 102.56 |

*Operating Martin 202 Equipment.
**Does not include Pioneer.

**LOCAL SERVICE AIRLINES**
**Comparison of Total Revenue Ton-Miles Flown**
**1951-1952**

| Carrier | 1951 | 1952 | % Increase |
|---|---|---|---|
| All Amer. | 3,210,906 | 2,782,460 | (13.34) |
| Bonanza | 734,316 | 1,081,017 | 47.21 |
| Central | 543,480 | 706,215 | 29.94 |
| Empire | 926,836 | 553,171 | — |
| Frontier | 3,321,453 | 3,958,896 | 19.19 |
| Lake Central | 668,315 | 575,721 | (13.85) |
| Mid-West | 42,715 | 13,975 | — |
| Mohawk | 1,590,989 | 1,875,060 | 17.85 |
| Ozark | 833,417 | 1,434,151 | 72.08 |
| Piedmont | 4,521,974 | 5,157,648 | 14.06 |
| Pioneer | 4,722,037 | 5,128,361 | 8.60 |
| Southern | 1,831,966 | 2,169,819 | 18.44 |
| Southwest | 2,981,833 | 3,304,513 | 10.82 |
| Trans-Texas | 1,996,911 | 1,970,247 | (1.34) |
| West Coast | 1,134,464 | 1,762,932 | 55.40 |
| Wiggins | 37,152 | 31,164 | (16.12) |
| Wisc. Central | 1,610,164 | 2,625,174 | 63.04 |
| Total | 30,708,928 | 35,130,524 | 14.40 |

MEMO TO:

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willing to have its service suspended in favor of the local service company and it apparently believes that the local service operator can more fully exploit the potential of Erie. The record in this case seems to justify that conclusion and accordingly, it is found that the public convenience and necessity require the temporary suspension of American's service at Erie and, as heretofore determined, the inclusion of Erie on the new segment of All American's route between Williamsport and Cleveland . . ."

Regarding its decision against suspension of Capital Airlines' service at Harrisburg, Pennsylvania, in favor of Allegheny, the Board said:[4]

". . . The carrier points out that Harrisburg is an important city which has generated a substantial profit for Capital at a compensatory mail rate. Bureau Counsel's exhibits in this proceeding also show Harrisburg's importance to Capital. While Bureau Counsel and Capital do not agree as to the exact amount of loss that would accrue to Capital from the Harrisburg suspension, they both agree that substantial loss would occur. We are convinced that a suspension of Capital's service at Harrisburg would impose an unwarranted financial loss upon Capital.

"As long as Capital remains in Harrisburg, there would be no justification for establishing a duplicate service by Allegheny between Harrisburg and Washington via Baltimore. The record is clear that this route segment could not support the duplicative services of two different carriers . . .

". . . Where, as here, the authorization for Allegheny would undoubtedly require subsidy mail payments, we believe that a fuller exploration of the costs involved should be made before we could possibly consider granting the proposed routes . . ."

[4]All American Certificate Renewal Case, Docket 5053 et al., Order Serial No. E-7294, April 10, 1953 (adopted Initial Decision of Examiner, issued November 5, 1952).

**Comparison of Total Non-Mail Revenue (Cents Per Revenue Mile) 1951-1952**

| Carrier | 1951 | 1952 | % Increase |
|---|---|---|---|
| All American | 59.60 | 56.15 | (5.79) |
| Bonanza | 46.02 | 52.86 | 14.86 |
| Central | 22.30 | 18.43 | (17.35) |
| Empire | 36.66 | 40.04 | 9.22 |
| Frontier | 35.06 | 41.65 | 18.80 |
| Lake Central | 35.58 | 31.49 | (11.50) |
| Mid-West | 2.61 | 2.19 | (16.09) |
| Mohawk | 72.08 | 64.72 | (10.21) |
| Ozark | 24.03 | 31.50 | 31.09 |
| Piedmont | 65.00 | 64.22 | (1.20) |
| Pioneer | 62.22 | 78.07 | 25.47 |
| Southern | 33.03 | 37.25 | 12.78 |
| Southwest | 63.40 | 68.15 | 7.49 |
| Trans-Texas | 33.18 | 39.29 | 18.41 |
| West Coast | 51.38 | 51.88 | 0.97 |
| Wiggins | 5.55 | 6.32 | 13.87 |
| Wisc. Central | 46.20 | 53.76 | 16.36 |
| Average | 45.90 | 50.55 | 10.13 |

Prompted by the Board's strongly expressed willingness to consider merger possibilities which might be in the public interest,[5] West Coast Airlines and Empire Air Lines negotiated an agreement to permit the acquisition of Empire by West Coast, upon Board approval of conditions of the agreement. After conduct of formal proceedings, the Board's approval was issued in its decision of June 27, 1952,[6] concurrently with its decision in the Empire Renewal Case[7] that, among other things, authorized two route extensions which would connect the until then separated route systems of the two carriers and which offered new one-plane service to a sizable volume of traffic that theretofore had enjoyed only connecting services.

**LOCAL SERVICE AIRLINES**
**Comparison of Revenue Express and Freight Ton-Miles Flown 1951-1952**

| Carrier | 1951 | 1952 | % Increase |
|---|---|---|---|
| Total | 1,749,363 | 1,947,845 | 11.13 |
| Bonanza | 19,099 | 37,694 | 97.36 |
| Central | 16,919 | 34,187 | 102.06 |
| Empire | 18,511 | 9,824 | — |
| Frontier | 380,601 | 493,024 | 29.54 |
| Lake Central | 86,240 | 54,996 | (36.23) |
| Mohawk | 100,648 | 99,782 | (0.86) |
| Ozark | 59,952 | 70,331 | 17.31 |
| Piedmont | 211,435 | 243,340 | 15.09 |
| Pioneer | 206,198 | 221,242 | 7.30 |
| Southern | 79,359 | 88,403 | 11.40 |
| Southwest | 171,723 | 162,190 | (5.55) |
| Trans-Texas | 94,537 | 112,393 | 18.89 |
| West Coast | 46,160 | 61,679 | 33.62 |
| Wiggins | 1,701 | 1,781 | 4.70 |
| Wisc. Central | 107,408 | 138,341 | 28.80 |
| All American | 148,872 | 118,638 | (20.31) |

Through adoption of the Examiner's Report in the Merger Case[8] the Board said, in part, that

"the merged system will undoubtedly attract new traffic by reason of improvements of service that will come into being. . . . On the basis of the evidence as it appears from the record it is reasonably clear, and it is

[5]Southwest-West Coast Merger Case, Docket 4405 et al., Order Serial No. E-5594, August 7, 1951.

[6]West Coast-Empire Merger Case, Docket 5220, Order Serial No. E-6550, June 27, 1952.

[7]Docket 4852 et al., Order Serial No. E-6551, June 27, 1952.


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so found, that a merger of the West Coast and Empire systems would require less assistance from the Government in the form of mail pay than would be required in the event West Coast and Empire operated their respective systems as separate entities with the proposed route extensions connecting the systems."

In addition to the West Coast-Empire merger, approved by the Board nearly a year ago, a formal proceeding[7] has been instituted to consider the agreement filed with the Board which would, if approved, merge the routes of Lake Central Airlines with those of North Central Airlines. Other applications for the acquisition of the Lake Central routes will also be consolidated in that proceeding and considered by the Board.

On January 17, 1952, the Board instituted an investigation relating to the possibility of a merger of the routes of Southwest Airways and Bonanza Air Lines (Order Serial 6041). Consideration is being given to the consolidation of this proceeding with the Bonanza Air Lines Renewal Case.

In its decision on the Mohawk route renewal, and making specific reference to Mohawk's financial status, the Board discussed at some length its policy relating to the capital structure of the airlines:[8]

"We have been advised that Robinson is in the process of altering its capital structure by conversion of debenture bonds to equity capital. The carrier is to be commended for this action. We are convinced that primary reliance on equity capital rather than debt is desirable for both local service and trunk carriers. Transportation as a whole, and air transportation in particular, as we have seen in the not too distant past, is subject to sharp contractions during the recession phase of the business cycle. During such periods, a capital structure which includes extensive reliance on debt, with its fixed obligations that must be met when due, inevitably places the carrier in jeopardy of bankruptcy. Such risks are substantially reduced when the carrier is soundly financed with equity securities; for equity capital, with its freedom from fixed charges, will act as a cushion against economic adversity. Moreover, the airline industry characteristically is one with a relatively small permanent capital investment in comparison with non-transport utilities. The largest share of its capital is invested in assets having a high rate of technological obsolescence. These characteristics contribute to the lesser desirability of reliance on debt as compared with common stock financing for both fixed capital and working capital requirements."

In summary, during the last 12 months the Board's efforts have been devoted toward strengthening the local service carrier industry and providing maximum service to the public consistent with reasonable burden upon the Federal Treasury.

The next several years will be critical in the development of the local service industry. It is evident that the future of the local service experiment may be jeopardized if subsidy demands continue to increase. ★ ★ ★

**LOCAL SERVICE AIRLINES**
**Comparison of U. S. Mail Ton-Miles Flown**
**1951-1952**

| Carrier | 1951 | 1952 | % Increase |
|---|---|---|---|
| All American | 60,157 | 63,071 | 4.84 |
| Bonanza | 6,483 | 16,563 | 155.48 |
| Central | 22,291 | 33,001 | 48.05 |
| Empire | 25,559 | 14,929 | — |
| Frontier | 127,808 | 109,740 | (14.14) |
| Lake Central | 15,276 | 15,495 | 1.43 |
| Mid-West | 9,501 | 3,406 | — |
| Mohawk | 28,373 | 34,005 | 19.85 |
| Ozark | 23,814 | 40,578 | 70.40 |
| Piedmont | 65,808 | 85,823 | 30.41 |
| Pioneer | 108,428 | 125,893 | 16.11 |
| Southern | 86,011 | 86,387 | 0.44 |
| Southwest | 62,909 | 84,432 | 34.21 |
| Trans-Texas | 50,766 | 63,684 | 25.45 |
| West Coast | 10,628 | 20,254 | 90.57 |
| Wiggins | 1,352 | 1,100 | (18.64) |
| Wisc. Central | 60,292 | 94,696 | 57.06 |
| Total | 765,456 | 893,057 | 16.67 |

**LOCAL SERVICE AIRLINES**
**Comparison of Revenue Passenger Miles Flown**
**1951-1952**

| Carrier | 1951 (000) | 1952 (000) | % Increase |
|---|---|---|---|
| All American | 30,689 | 26,798 | (12.68) |
| Bonanza | 7,716 | 10,751 | 39.33 |
| Central | 5,262 | 6,689 | 27.12 |
| Empire | 9,463 | 5,622 | — |
| Frontier | 28,015 | 34,025 | 21.45 |
| Lake Central | 6,176 | 5,481 | 11.25 |
| Mid-West | 406 | 128 | — |
| Mohawk | 16,276 | 19,220 | 18.09 |
| Ozark | 8,130 | 14,147 | 74.01 |
| Piedmont | 44,380 | 50,435 | 13.64 |
| Pioneer | 43,891 | 48,886 | 11.38 |
| Southern | 17,439 | 20,820 | 19.37 |
| Southwest | 27,383 | 31,331 | 14.42 |
| Trans-Texas | 18,455 | 18,361 | (0.51) |
| West Coast | 11,930 | 18,674 | 56.53 |
| Wiggins | 382 | 313 | (18.06) |
| Wisc. Central | 15,303 | 25,238 | 64.92 |
| Total | 291,296 | 336,919 | 15.66 |

[7] Lake Central Acquisition Case, Docket 5770 et al.

[8] Robinson, *op. cit.*

## MAINTENANCE COSTS

*(Continued from page 27)*

of cylinders each year. Frontier uses about 240 per year and this represents an investment of about $11,000 annually. Since the average return per passenger for the entire local service industry is about $11, Frontier must carry another 1,000 revenue passengers to compensate for the increased costs of only one engine part.

What is true of cylinders is also true of other engine parts. In 1950 a Pratt & Whitney piston cost only $2.20. In 1953 the cost had increased to $6.50 and Frontier Airlines, operating 12 DC-3's, uses about 120 each year.

Perhaps one of the most drastic increases is in the crankshafts. In 1950 a 59284 P-W crankshaft cost only $75 new. In 1953 a reconditioned crankshaft costs from $300 to $400. This represents another $7,875 that must be made up either in increased revenue or reduced costs. Since it seems that it is virtually impossible to reduce costs the only answer is to increase revenues. So crankshafts alone require another 715 passengers, at the general average return for the local service carriers.

What does all this mean? Simply that one local service carrier, such as Frontier, must develop an additional 1,715 passengers to take care of the increased costs on only two engine parts. And this is an optimistic appraisal since other costs are included in every ticket sold, and costs are up all around.

The crux of the whole problem is that during the past few years the DC-3 operators have been able to take advantage of surplus engines and parts, but are beginning to pay the penalty as the supply narrows. The Douglas Aircraft Company has been most efficient in producing new parts for the DC-3 — but not at used parts prices. The situation is further complicated by the fact that there are only a few

**LOCAL SERVICE AIRLINES**
**Number of Employes**
**Year 1952**

| Carrier | Beginning of Year | End of Year | % Increase |
|---|---|---|---|
| All American | 462 | 474 | 2.60 |
| Bonanza | 134 | 186 | 38.81 |
| Central | 285 | 261 | (8.42) |
| Empire | 117 | — | — |
| Frontier | 539 | 545 | 1.11 |
| Lake Central | 155 | 161 | 3.87 |
| Mid-West | 46 | — | — |
| Mohawk | 235 | 250 | 6.38 |
| Ozark | 339 | 379 | 11.80 |
| Piedmont | 483 | 601 | 24.43 |
| Pioneer | 447 | 449 | 0.45 |
| Southern | 439 | 463 | 5.47 |
| Southwest | 308 | 355 | 15.26 |
| Trans-Texas | 370 | 368 | (0.54) |
| West Coast | 158 | 359 | 127.22 |
| Wiggins | 33 | 35 | 6.06 |
| Wisc. Central | 300 | 488 | 62.67 |
| Total | 4,850 | 5,374 | 10.80 |


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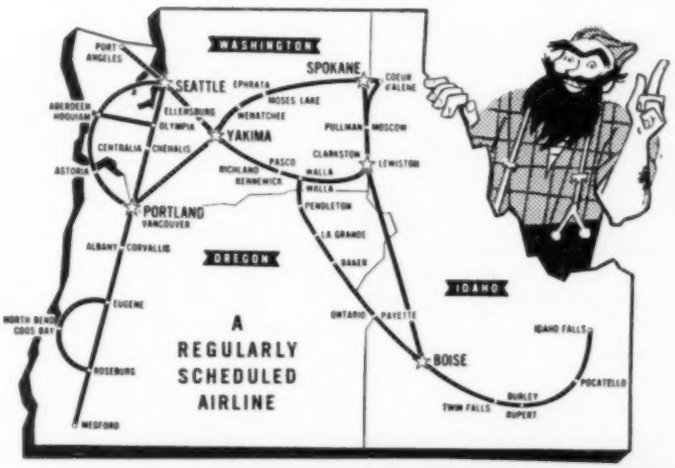


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N54549 — Model 18-40, serial No. 2008, *Air Carrier certificated*, fitted as transport with comfortable accommodations for 12 passengers plus crew. Has R1820 G-102A engines. Total airframe time 2713 hours. All mandatory modifications complied. No corrosion. Deicer boots installed. Price: **$35,000** flyaway Glendale, Calif.

CF-FRW — Model 18-08, serial No. 2363, 14 passenger seats. Clean interior. R1820-G205A engines. Total airframe time 1140 hours. Deicing provisions. Standard radio. Ferry fuel tanks installed in cabin. Price: **$16,000** "as is" LeBourget Field, Paris, France

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dealers in engine parts and accessories and it seems that the price is established on the age-old basis of what the traffic will bear.

The transition from surplus to new parts has resulted in an over-all increase on all engine and frame parts. But parts are only a part of the over-all picture. Hardware shows a 25 per cent increase over 1950 and propeller blades that used to cost $75 each now cost $135 and Frontier uses about 36 blades each year.

### No Relief in Sight

There seems to be no relief for the rising costs so the local service carriers are faced with the prospect of continuing to pay, hoping that the sparsely settled areas served will generate enough business to offset the increased costs.

While the parts situation is serious enough, carriers must recognize the spiraling cost of personnel. In 1950 the average salary of Frontier employes was $292. At the end of 1952, this had increased to $388, an increase of 33 per cent. With a monthly payroll of about $211,400 per month, this again represents a lot of passengers that have to come from some place. The same problem is facing all local service carriers.

The small airlines are in a tough position. Revenues have not kept pace with increased costs and there is little possibility that they ever will.

One answer to the dilemma is new and more efficient equipment. That seems a long way off so the efforts of the smaller carriers will have to be concentrated on more traffic and still more efforts to reduce costs. ★ ★ ★

**LOCAL SERVICE AIRLINES**
**Comparison of Revenue Passengers Carried**
**1951-1952**

| Carrier | 1951 | 1952 | % Increase |
|---|---|---|---|
| All American | 213,896 | 183,986 | (13.98) |
| Bonanza | 30,216 | 43,705 | 44.64 |
| Central | 35,351 | 47,167 | 33.42 |
| Empire | 44,658 | 28,617 | — |
| Frontier | 104,782 | 127,398 | 21.57 |
| Lake Central | 31,564 | 33,213 | 5.22 |
| Mid-West | 2,693 | 866 | — |
| Mohawk | 103,696 | 110,514 | 6.57 |
| Ozark | 49,507 | 84,463 | 70.61 |
| Piedmont | 189,831 | 224,702 | 18.37 |
| Pioneer | 164,171 | 183,271 | 11.63 |
| Southern | 96,818 | 121,375 | 25.36 |
| Southwest | 137,821 | 165,057 | 19.76 |
| Trans-Texas | 77,799 | 78,214 | 0.53 |
| West Coast | 78,876 | 114,937 | 45.72 |
| Wigins | 4,094 | 3,178 | (22.37) |
| Wisc. Central | 96,300 | 153,067 | 58.95 |
| Total | 1,462,083 | 1,703,730 | 16.53 |

**LOCAL SERVICE AIRLINES**
**Comparison of Revenue Miles Flown**
**1951-1952**

| Carrier | 1951 | 1952 | % Increase |
|---|---|---|---|
| All Amer. | 3,326,325 | 3,223,623 | (3.09) |
| Bonanza | 928,371 | 1,227,264 | 32.20 |
| Central | 1,462,781 | 1,705,856 | 16.62 |
| Empire | 1,277,445 | 731,439 | — |
| Frontier | 4,550,432 | 4,649,008 | 2.17 |
| Lake Cent. | 1,240,663 | 1,111,961 | (10.37) |
| Mid-West | 773,387 | 263,864 | — |
| Mohawk | 1,546,870 | 1,988,489 | 28.55 |
| Ozark | 2,055,915 | 2,681,276 | 30.42 |
| Piedmont | 4,198,103 | 5,026,904 | 19.74 |
| Pioneer | 4,051,422 | 3,849,793 | (4.98) |
| Southern | 3,026,198 | 3,339,729 | 10.36 |
| Southwest | 2,526,630 | 2,716,503 | 7.51 |
| Trans-Texas | 2,948,508 | 2,784,011 | 5.58 |
| West Coast | 1,372,056 | 2,099,356 | 53.01 |
| Wiggins | 529,168 | 430,545 | (18.64) |
| Wisc. Cent. | 1,982,862 | 2,867,727 | 44.63 |
| Total | 37,797,136 | 40,697,348 | 7.67 |

## LOCAL SERVICE PROGRESS

*(Continued from page 49)*

While many observers refer to 1952 as the "leveling off" year for the local service carriers, early reports from the first quarter of this year indicate more growth will be attained in 1953 than in 1952. First quarter reports for 1953 include increases over the first quarter of 1952 of 24.41 per cent for revenue passengers, 24.24 per cent for revenue passenger miles, 19.72 per cent in revenue ton miles and 9.5 per cent in revenue miles flown. The average passenger load was up about 1 passenger per mile for the quarter and the ton-mile load factor was up to almost 33 per cent from 31.36 per cent.

Gains such as these, when coupled with the steadily improving efficiency of the local service organizations and their renewed efforts for greater utilization, point to more record achievements during 1953. ★ ★ ★


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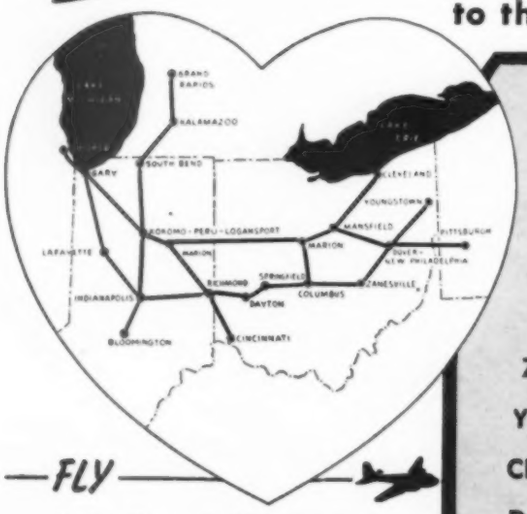


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### Airmen's Calendar

June 12-14—All Missouri Air Tour from Columbia.

June 13-14—Minnesota Flying Farmers Annual Meeting New Ulm.

June 14-16—Civil Air Patrol Wing Commanders Conference and National Executive Board Meeting, Cheyenne, Wyoming.

June through August—Annual CAP Cadet Encampments at 44 Air Bases.

June 17-19—ADMA Mid-year Meeting, Chateau Lake Louise, Alberta, Canada.

June 20—Fraternity of the White Heron Fish Fry, Anahuac, Texas, with Texas State Aviation Association Fly-In.

July 4-5—Cole's County Airport dedication, with Air Fair, Mattoon, Ill.

July 7-16—National Soaring Contest, Elmira, N. Y.

July 9-12—6th Annual International Aviation Exposition, sponsored by Aero Club of Michigan, Detroit-Wayne Airport, Michigan.

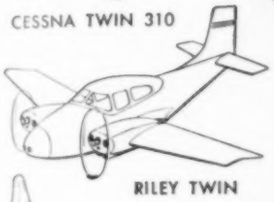
July 25-Aug. 7—Trans-Canada Air Tour Sponsored by Portland, Oregon, Chamber of Commerce, Royal Canadian Flying Club and Columbia Aviation Country Club.

Aug. 2—Jaycee Air Fair, 50th anniversary of powered flight observance, Tradewind Airport, Amarillo, Texas.

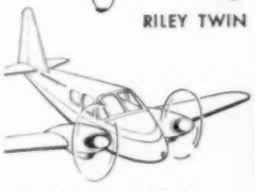
**CONSTANT-SPEED, FULL FEATHERING PROPELLERS**

AERO COMMANDER

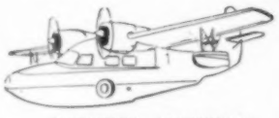
CESSNA TWIN 310



RILEY TWIN



PIPER TWIN APACHE



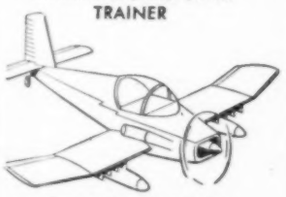
WIDGEON AMPHIBIAN CONVERSION

**CONSTANT-SPEED PROPELLER**

CESSNA 180

**HYDRO-SELECTIVE PROPELLERS**

SWEDEN'S SAAB SAFIR TRAINER



FLETCHER DEFENDER (Japanese Manufacture)

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## Hartzell constant-speed propellers for small planes

Hartzell constant-speed (governor-controlled) and full-feathering, constant-speed propellers are now in production for use on a large percentage of current executive-type aircraft. High performing metal blades are combined with a low-cost hub of simple construction, requiring minimum maintenance. Operation of the pitch-changing mechanism is by means of oil pressure supplied by a governor mounted on the engine.

The feathering version may be quickly feathered and unfeathered in the air with no auxiliary mechanism or power source required.

**SPECIFICATIONS FOR CURRENT CAA-APPROVED PROPELLER-ENGINE COMBINATIONS**

| ENGINE | H.P. | Propeller Diameter | NON-FEATHERING — Pitch Range 24° | | FEATHERING — Pitch Range 70° | |
|---|---|---|---|---|---|---|
| | | | Model No. | Weight Including Spinner | Model No. | Weight Including Spinner |
| Lycoming O-290-D2A O-320 | 140 150 | 72" - 76" | HC-82XG—1/7636C | 58 lbs. | HC-82XG—2/7636C | 63 lbs. |
| Continental O-470-A | 225 | 84" - 88" | HC-82XF—1/8833 | 65 lbs. | HC-82XF—2/8833 | 70 lbs. |
| Lycoming GO-435-C2B | 240-260 | 90" - 93" | HC-82X20—1/9333 | 67 lbs. | HC-82X20—2/9333 | 72 lbs. |

## HARTZELL PROPELLER COMPANY

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# More Power or Less Drag?

## How aerodynamic refinements can bring greater economy and more usefulness

By AUGUST RASPET,
Aerophysics Department,
Mississippi State College

EDITOR'S NOTE: One of the timeliest and most interesting discussions during last month's annual gathering of the Aviation Writers Association were the following views by one of America's leading aerodynamicists.

IN motorless flight there are but two avenues for progressive improvement: One is to seek better sources of power available in the atmosphere and the other is to improve the aircraft itself. Today's airplane designers have all too often pursued a third avenue of improvement, that of increasing the power of the engine. Jet engines having powers up to 20,000 horsepower are now attainable. High-powered aircraft place our pilots in the sad plight of carrying a heavy load of fuel even if intermediate ranges are to be flown, in order to take care of the requirements of high fuel consumption. Heavy loads lead to high take-off and landing speeds. To cope with these high speeds, we need superpilots, the lack of which is all too evident today.

### The Need for Aerodynamic Efficiency

But we need not look only to the heavy jet bombers for evidence of the airplane designer's recourse to adding power instead of improving the aerodynamics of airplanes. A small four-place airplane recently tested for performance was found to require only 52 horsepower to propel it at its top speed, yet it required an engine of nearly 3 times this power to attain its top speed. Imagine, if you will this same airplane improved by aerodynamic means so that it could cruise on 52 horsepower. The fuel consumed would be about one-third of its present consumption and this airplane would carry at full range only one-third of its present load of fuel. With the lowered fuel weight would come lower landing and take-off speeds.

When a designer adds power to overcome high drag, he burdens his airplane with ever increasing high landing and take-off speeds. On personal aircraft not only is the bigger engine more expensive but also it weighs more, costs more to maintain, and burns more fuel.

Now you may ask, "How does this diatribe fit in with the philosophy of motorless flight research?" Since the energy present in the atmosphere is fixed by the sun's heat radiation, all soaring contestants are treated equally by nature insofar as power availability is concerned. The only course left to the progressive sailplanist is to improve the aerodynamics of his sailplane. To this end, he employs the latest knowledge in boundary layer theory, because most of the energy losses at high speeds come from the friction of the air against the outside surfaces of the sailplane. By utilizing motorless flight research techniques, R. H. Johnson developed his sailplane, RJ-5, from a mediocre performer with a glide ratio of 30 to 1 to the world's most efficient aircraft having a glide ratio of 40 to 1. The drag of this sailplane is now far below that of any jet airplane. This high performance was achieved after some thousands of hours of modification, testing and diagnosis which dictated in each case additional modifications and improvements. *It is safe to say that no airplane in the world has undergone as extensive a program of performance improvement as has the RJ-5.*

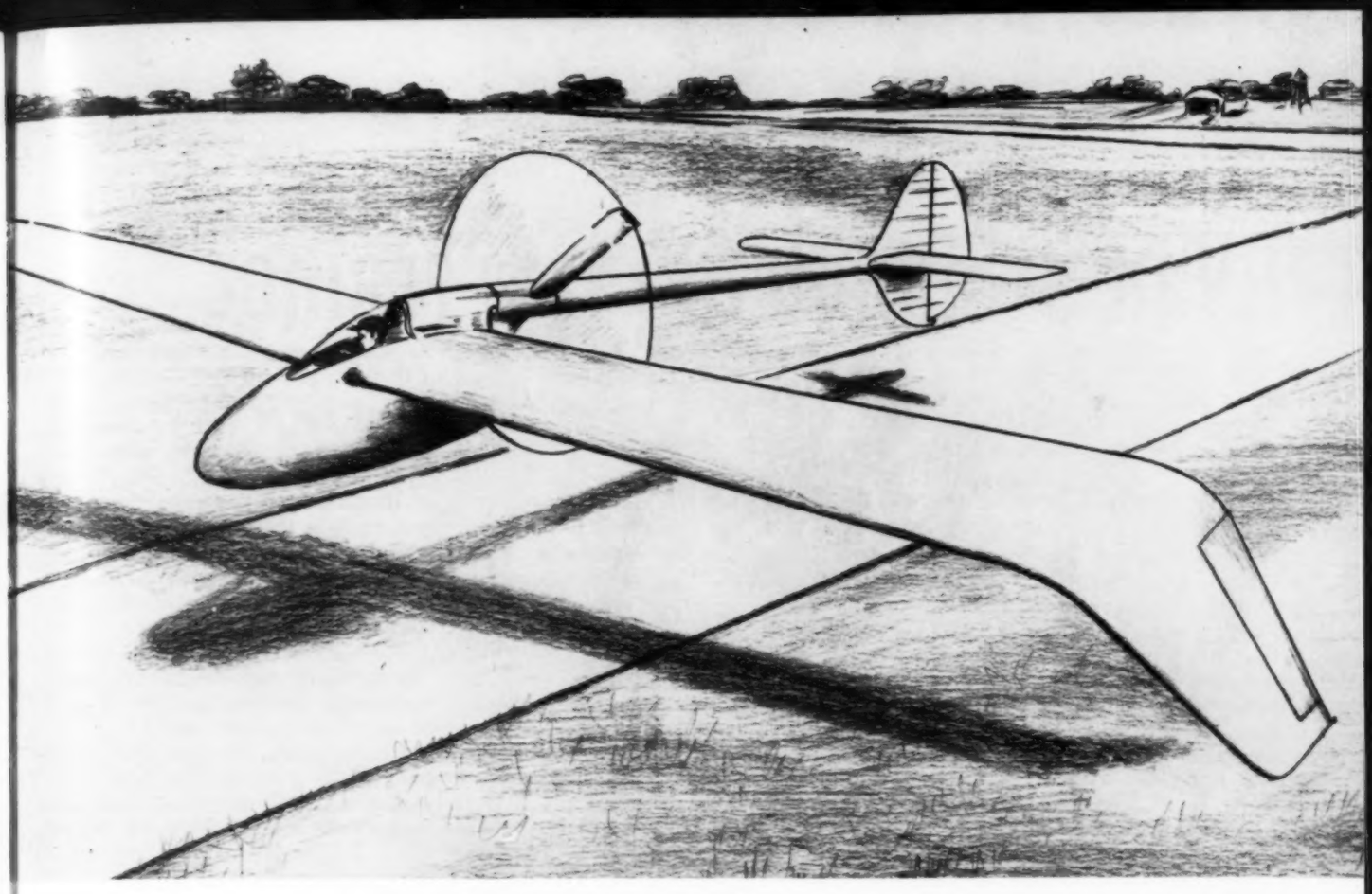
Yet we must hang our heads in shame when we compare the RJ-5 with one of nature's own sailplanes, the black buzzard. By means of sailplane research methods, consisting of tracking wild buzzards with a sailplane and measuring the relative performance of the buzzard with respect to the sailplane, it is possible to determine the performance of the bird. From such measurements, the author found that the bird has a drag coefficient one-half of that of RJ-5.

### Suction Airfoil on Sailplane

How does he do it? Presently at Mississippi State College, we are investigating a process which nature may perhaps employ to reduce the drag of its high performance birds. The process consists of sucking a portion of the slowed-down air near the surface of a wing or fuselage into the interior and exhausting this air after accelerating it to the speed of flight. The air is sucked through more than a million small holes pricked or drilled into the sailplane's wing. Not only can this process of suction boundary layer control be used to achieve low drag, but it can also be used to prevent the stalling of a wing.

A wing of a sailplane, which in conventional design stalls at 40 mph., stalls at a speed of 30 mph. with suction applied by a blower system requiring only 1.4 horsepower. The potential of this technique is still not exhausted; each step in the research results in a further reduction of stalling speed.

Let us now take a look at the benefits in performance which can be derived from suction boundary layer



The author's design for a muscle-powered sailplane features a wing perforated with a million or so small holes for boundary layer control through porous suction. For take-off, both a small, retractable wheel and a pusher-type blade are driven bicycle-fashion by a pedal arrangement in the cockpit. Minimum take-off thrust horsepower is calculated to be 0.05, said by the author to be well within the capabilities of a man's muscle power. The propeller has hollow blades which enable it to serve as a suction pump for pulling air through the porous wing surface and thereby greatly reducing drag while maintaining control at low speeds. Flight in such a craft would also utilize ground effect for drag reduction. Projected specifications include 40-ft. span, 5-ft. chord, 600-sq. ft. wetted area, 300-lb. flying weight. Drag coefficient would be 0.00456, minimum flight speed 18 mph., maximum glide ratio 37 to 1 and minimum sinking speed 1.4 ft. per sec. at an altitude one span length above the earth. Ultra-light sandwich construction would be used, in which two Fibreglas skins are spaced so far apart by very low density porous plastic that an efficient compression element results. About muscle power, the author states: "Near the ground the power required would be only 0.45 hp. Since man can develop for 20 seconds 1.3 hp., there would be sufficient power for take-off. Even if a propulsion efficiency of only 50% were obtained, human-powered muscle flight would be possible with this machine."

# Sailplane For Muscle Power

control when applied to drag reduction. When our technology is developed to the stage where the flow over the entire surface of an airplane will be laminar, the drag of an airplane of the Comet type will be 10 per cent of that of the present craft; and with the same fuel and speed, the range will be increased 750 per cent. Most of us know full well the impact of the Comet's success on our industry. One needs no superior imagination to visualize not simply the impact, but rather the explosion, which must result from the application of suction boundary layer control to a jet liner. It is still within the power of our mighty nation to wrest the lead in jet transports from the British. But mark you, the British are not only aware of the potential of this process, they are *working on it* in high-speed flight. We in motorless flight research in a humble way feel that we are contributing and can contribute even more than we are now to our nation's progress in this form of fine aerodynamics.

### 10-to-1 Speed Range Is Goal

Now let us come back from our trip in a boundary layer controlled jet liner which has both long range and low landing and take-off speeds to the personal airplane utilizing some of these same principles. Seven years ago Grover Loening, a noted aeronautical engineer of some forty years experience in aviation, made the comment that the ideal personal airplane will take off at 20 mph. and have a top speed of 200 mph. We are, of course, still far from this goal. The best airplane today lands at 60 mph. and tops 180 mph., a ratio of 3 to 1, instead of 10 to 1. This ratio is directly related to the maximum lift and the minimum drag, both parameters now being intensively studied by motorless flight methods. In addition, much more of the available engine horsepower must be put into effective propulsion. Means for measuring the effectiveness of propulsion have been developed from motorless flight research techniques. Suction applied to the control of the boundary layer will permit lower landing speeds and higher top speeds. We can at least say that the 20-200 mph. airplane is no longer a vision, it is well nigh a possibility; and we in motorless flight research are willing to accept the challenge of investigating the possibility by means of actual full-scale flight research.

*(Continued on page 84)*

# Ryan's Model 59 Jet Trainer

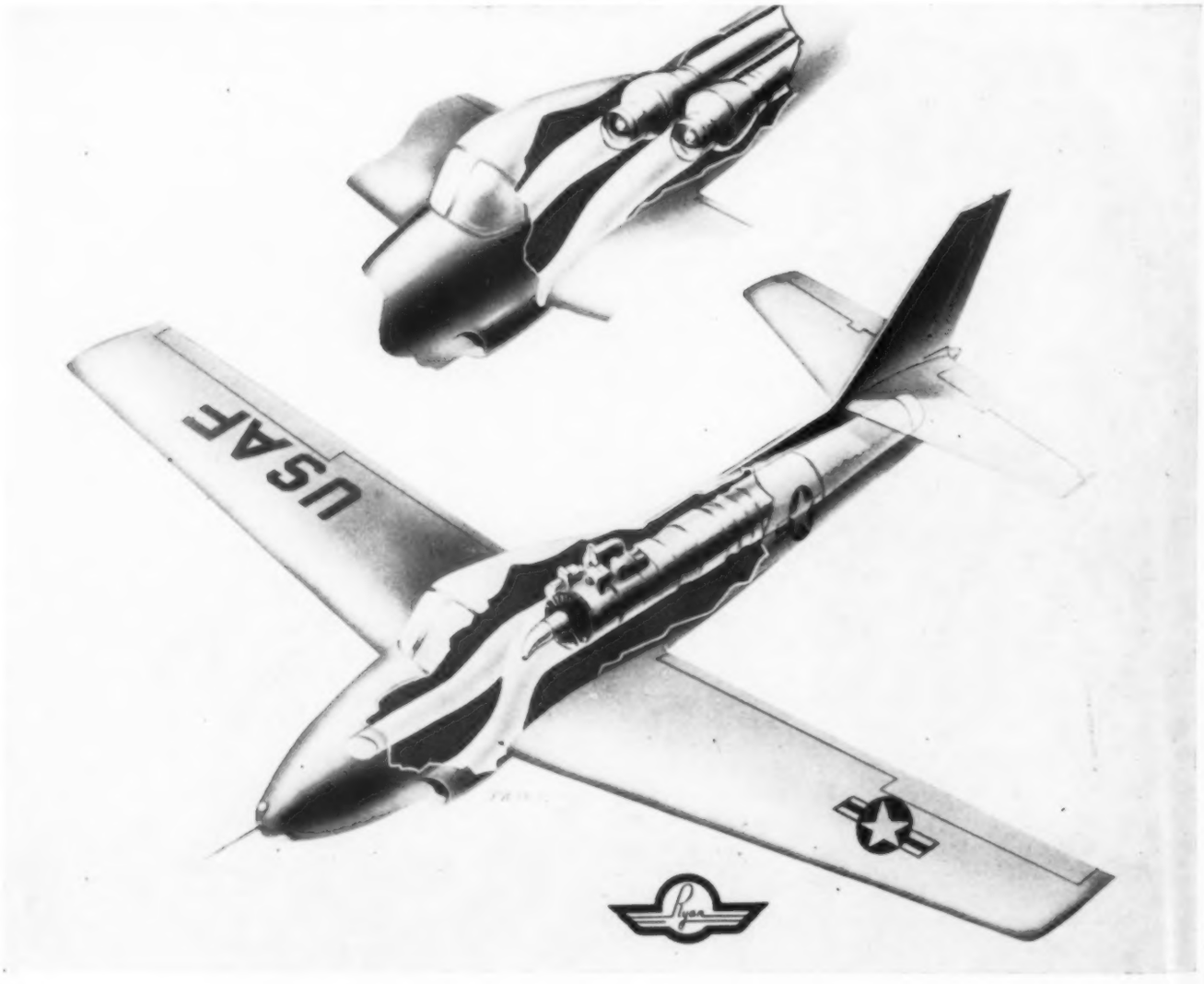
## Interesting details on a primary trainer which could mount one or two jet engines

RYAN Aeronautical Company has divulged details of a jet-powered primary trainer which it entered in the recent U. S. Air Force design competition and the Ryan entry, designated Model 59 by the company, offers some fundamental engineering concepts with interesting possibilities. While the competition was won by another entry — the twin-jet Cessna described in FLIGHT MAGAZINE some time ago — it may be that the USAF will eventually authorize development and production of additional designs. This, plus the fact that small jet engines are still in the early stages of development, serves to maintain a high level of interest in Ryan and other designs.

Without committing the Air Force or other user to any particular engine, Ryan engineers designed a jet trainer that can not only be built around any power plant that may be available in the near future, but can accommodate any engine of this power class that might be developed in the still more distant future.

Further, there is enough space in the Ryan trainer not only for a single engine in the fuselage, but enough volume has been provided for the installation of dual engines. For design

Flexibility of design features the Model 59, which would permit installation of one or two engines depending on military preference. In cutaway at top, two Continental Marbore jets are shown. Exhaust is from individual tailpipes directly above each other. Single-jet cutaway shows installation of Allison 520-C1. —(Ryan Drawing.)



poses two versions were submitted, one with a single Allison 520-C1 jet engine: the other with two French-designed Marbore 351 jets.

### High Performance

The Model 59 with Allison engine, probably the highest-performance design submitted in the Air Force competition, would have a maximum speed at sea level of 370 knots (427 mph.), maximum speed at 35,000 feet of 379 knots (438 mph.), and a cruising speed of 286 knots (329 mph.) at 35,000 feet.

Initial rate of climb would be 4,100 feet per minute. Its cruising ceiling would be 40,500 feet, service ceiling 42,700 feet. Take-off distance over a 50-foot obstacle would be 1,500 feet with flaps down, and landing distance over a 50-foot obstacle would be 2,500 feet at full gross weight.

With the two Marbore engines, the Model 59 would have a cruising speed of 286 knots (329 mph.) at 35,000 feet, and maximum speeds of 356 knots (410 mph.) and 371 knots (428 mph.) at sea level and 35,000 feet, respectively.

To extend the endurance, range and utility of the plane, fixed wing-tip tanks of 100 gallons each could be installed. The additional 200 gallons of fuel would extend the endurance from 2.9 hours to 5.16 hours at 35,000 feet with the Allison engine.

The Model 59 offers a hitherto untapped potential — the production of a primary trainer that could be adapted to prospective fighter and bomber pilots. On the same assembly line, single-engine and dual-engine installations could be made, the single-engined aircraft to be employed by fighter trainers who would graduate to single-engine combat types, and the dual-engine planes to be utilized for more rapid adjustment of bomber trainees to multi-engined operation. The same basic trainer could be used for both, with no interrupting of production flow in the factory because either installation uses the same fuselage section.

The psychology, the needs and the aptitudes of the average student pilot were known and taken into consideration when the Model 59 design assumed shape. This human factor is extremely important in the new jet age, when training is complicated by the leap from the 250-mph. reciprocating engine plane in which the pilot learns the fundamentals of flight, to the 600-mph. jet combat plane — a gargantuan stride, with engine power increasing fourfold. Ryan engineers believe the two-place, side-by-side Model 59 — like the wartime Ryan PT low-wing trainer series, revolutionary innovator in its field — fills the gap.

Ryan says its Model 59 would cruise at 329 mph. at 35,000 ft., where maximum speed would be 438 mph. Note side-by-side seating. Two Marbore jets at 880 lbs. of thrust each or a single Allison rated at 1,870 lbs. of thrust would be used, with the Allison-powered version described as being the fastest.
—(Ryan Drawing.)

### Both Engines on Center Line

An example of the effort to create a smooth, safe transition for the student pilot is the approach taken toward the possibility of failure of one engine in the dual-engine type trainer. In the Model 59 with the Marbore engines, twin-engine safety would be achieved without adverse yaw effects such as might be expected in twin-engine planes when one engine fails. This can be accomplished because both engines in the Ryan trainer would be housed together in the fuselage, with the center of thrust down the center line of the plane.

In the conventional twin-engine arrangement, when an engine located in a wing root fails, the pilot must compensate for the inevitable yaw, complicating training in the primary phases. In the Model 59, with two Marbores, if one engine quit, there would simply be less thrust, but no trouble to the pilot from the standpoint of control. With one tailpipe located directly above the other in the aft fuselage, yaw would be no problem.

Each of the engines in the Model 59 dual-engine arrangement receives air from one side entry duct, and exhaust is from the individual tailpipe. A butterfly valve in each entry duct, controlled from the cockpit, permits the closing of the entry when one engine is inoperative, thus reducing internal drag losses.

In the specified power class of the trainer, two jet engines have reached the most advanced stage of development — the Allison Model 520-C1 and the French-designed Turbomeca Marbore. The Allison is being prepared for

*(Continued on page 91)*

# Bell's Improved Model 47G

BELL Aircraft Corporation at Fort Worth last month announced an improved "G" series of its widely-used Model 47 helicopter, the newer version replacing the 47D-1 on production lines which are turning out the 3-place, 200-hp. helicopters for all of the U. S. armed services, commercial customers and foreign markets.

Civil Aeronautics Administration conformity tests were nearing completion late in May on several basic control and rotor blade improvements. These include metal tail rotor blades, already announced, and other significant changes. It has been known for some time that Bell was experimenting with hydraulic boost for the cyclic control, a development aimed at improved stick feel. It is also known that Bell has been engaged in automatic pilot developments, but these are believed intended for larger machines than the Model 47.

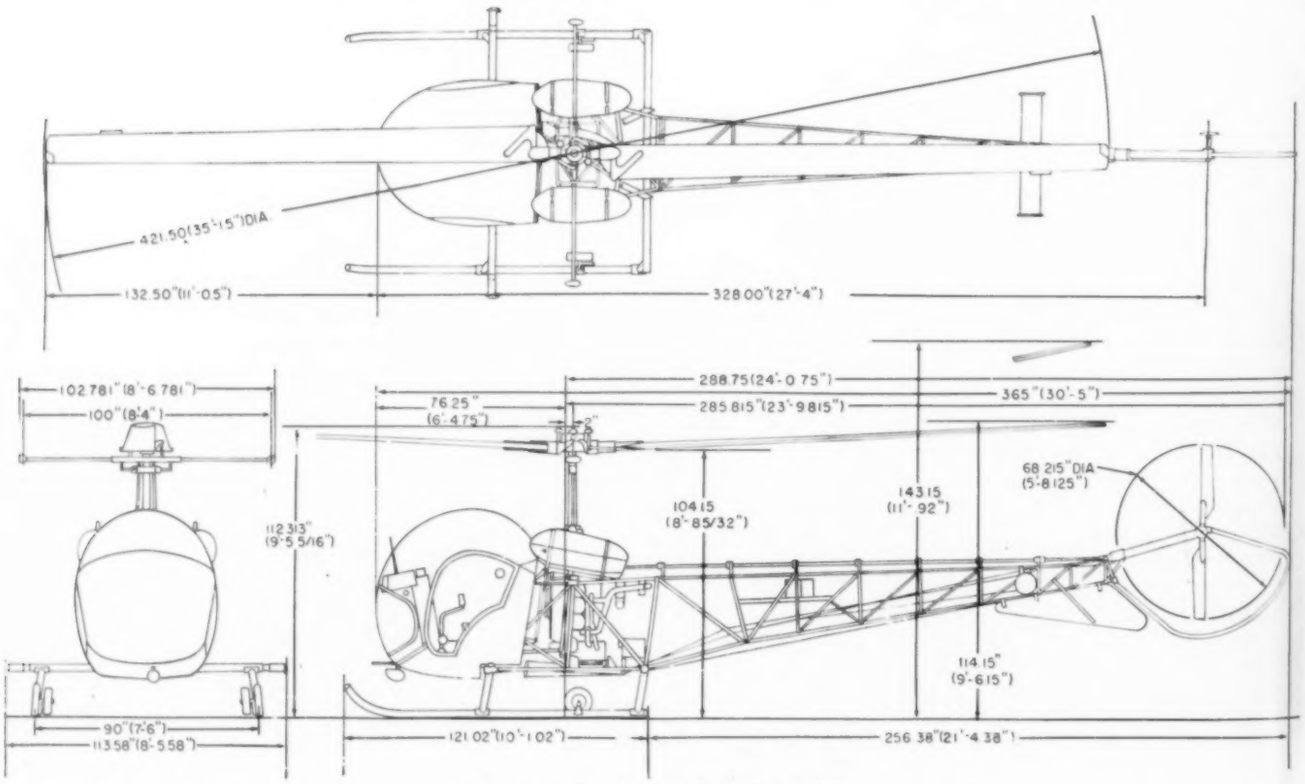
Model 47G features include a newly-perfected synchronized elevator, by which the helicopter's permissible center-of-gravity travel is increased 40 per cent. The elevator is synchronized to operate with the tilt of the rotor. It is a small aluminum airfoil of 42-in. span and 12-in. chord with disc end plates approximately 8 inches in diameter. It is mounted in the tail boom structure just forward of the tail rotor (see drawings below).

Coupled with the effect of the synchronized elevator are fuel tanks located directly on the center of gravity and an improved ballast system which eliminate the need for shifting the battery as formerly. A single aft battery location is sufficient for all loading conditions.

The new fuel tanks provide a total of 40 gals., or one-third more than the 47D-1 offered. This gives a proportionate increase in endurance and range.

Altogether, the new version carries 40 improvements. Other than those listed above, they include the following: A heavy-duty 50-amp. generator; a larger capacity battery with increased discharge rate; new seat and back cushions; improved lubricating system for lower needle bearing in transmission; new engine sprag mounts; new location for carburetor air intake; new ventral fins; new skid shoes for landing gear; and a new electrical system separation of cabin and center frame wiring so that the fuselage units can be readily detached by a few quick-disconnect plugs.

The Franklin engine in the 47G develops 200 hp. at 3,100 rpm. Empty weight is listed at 1,409 lbs. Two gross weight figures are used, 1,900 lbs. and 2,350 lbs. Performance is as follows, with figures for maximum gross in parenthesis: Maximum speed, 98 mph. (98); cruise speed, 81 mph. (77); maximum rate of climb at sea level, 1,150 fpm. (800); time to climb to 5,000 ft., 5 mins. (8 mins.); ceiling, 16,000 ft. (12,500); hovering ceiling in ground effect, 9,400 ft. (3,600); range, 246 miles (215).★★★




**Three View Drawings of Bell Model 47G**

One if by land...
two if by sea
But what if by air?
Surprise air attack is a possibility at any time. Long-range bombers equipped with atomic weapons could sneak by defenses—and only with the help of adequate detection can our Air Force and Army discourage and prevent such attack.
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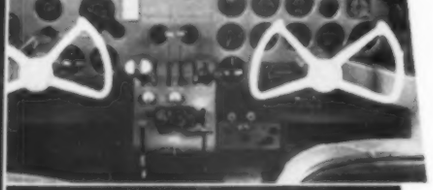

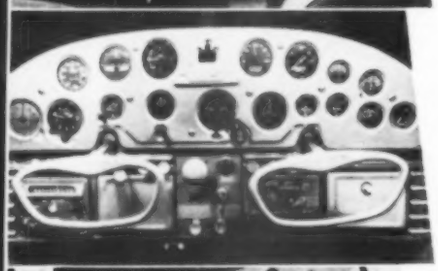

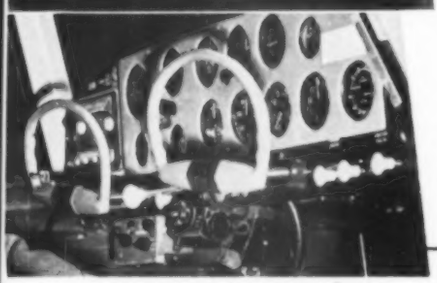

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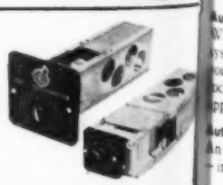

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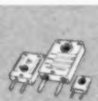
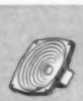


CRYSTALS

TUBES



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**L-2 STANDARD AUTOPILOT**

**This standard L-2 controller** gives the pilot *complete* and *automatic* control of his airplane in turbulent air or smooth. He is able to fly straight and level, make smoothly coordinated climbing and descending turns, or maintain the plane in any desired safe angle of climb or descent.

**L-2 AUTOPILOT ACCESSORIES:**

**Automatic Approach Coupler** — When added to your L-2 autopilot system it *automatically* "locks" your plane to the glide slope and localizer beams for a precision ILS approach.

**Automatic Altitude Controller** — An accessory for the L-2 autopilot — it *automatically* holds your airplane at any desired altitude between sea level and 55,000 feet. Weight, less shocks, 1.1 lbs.

**Yaw Trim Indicator** — An essential accessory to the Lear L-2 Autopilot to give constant, precise visual indication of faulty rudder or roll trim.

## TWO GREAT ADF'S

***ONLY LEAR OFFERS*** a complete line of automatic direction finders that meet the requirements of size, weight and performance for all three classes of aircraft — primary, intermediate and heavy. Each model of Lear ADF's is designed and built for one specific class of airplane and for a specific kind of operation. Lear ADF's are representative of nearly a quarter century of experience in aircraft radio. The many thousands of hours flown annually on thousands of Lear ADF's are not only testimony of the quality built into this equipment, but striking evidence of their dependable performance.

**ADF-12 "ORIENTER"**

**LEAR "ORIENTER"® — The Lear ADF-12** is a combined automatic direction finder, a broadcast receiver, and a radio range and communications receiver that weighs less than 18 pounds. It is accurate and very sensitive — provides reception on three bands: 190-430 kc; 480-1025 kc; and 1025-1725 kc. In addition, the ADF-12 contains facilities for furnishing modulation and power to Lear VHF transmitters

**ADF-14 "EXECUTIVE"**

**LEAR "EXECUTIVE" RADIO COMPASS — The Lear ADF-14** is a great new rugged ADF. It incorporates finest quality components and features that make it particularly well suited for multi-engine aircraft operation. The ADF-14 features Lear's exclusive Ferro-dynamic® loop. All components are hermetically sealed against dust and moisture and have been fungus proofed, assuring dependable performance under all climatic conditions. The "Executive" cover the three bands: 190-430 kc; 480-1025 kc; and 1025-1725 kc.

***There is a Lear distributor near your home airport . . . call him for demonstration . . . or write to Lear direct***

COAST TO COAST

Lear
AIRCRAFT RADIO PRODUCTS
Sales and Service

# LEAR INC. LEARCAL DIVISION

**11916 W. PICO BOULEVARD • LOS ANGELES 64, CALIFORNIA**

Grand Rapids Division, Grand Rapids, Mich. • Romec Division, Elyria, Ohio • Lear International Export Corp., 9 E. 45th St., New York 17, N.Y.

**WIND TUNNEL MODEL OF TEMCO JET TRAINER** design was displayed to Aviation Writers Association members at the Temco plant in Dallas. General Nathan F. Twining, new USAF staff chief (right), addressed the writers in a speech emphasizing the role of strategic air power.

# Aviation Writers See Texas Industry

GROWING importance of the aviation industry in the Dallas-Fort Worth area was emphasized last month at the 15th annual national convention of the Aviation Writers Association. More than 250 top U. S. and Canadian aviation writers and editors took part in an elaborately-arranged 6-day inspection of the following facilities:

Convair, where the B-36 will be followed in production by a long-range supersonic bomber now being readied for the Air Force.

Carswell Air Force Base, headquarters for the 8th Air Force which operates Strategic Air Command B-36's in combat readiness.

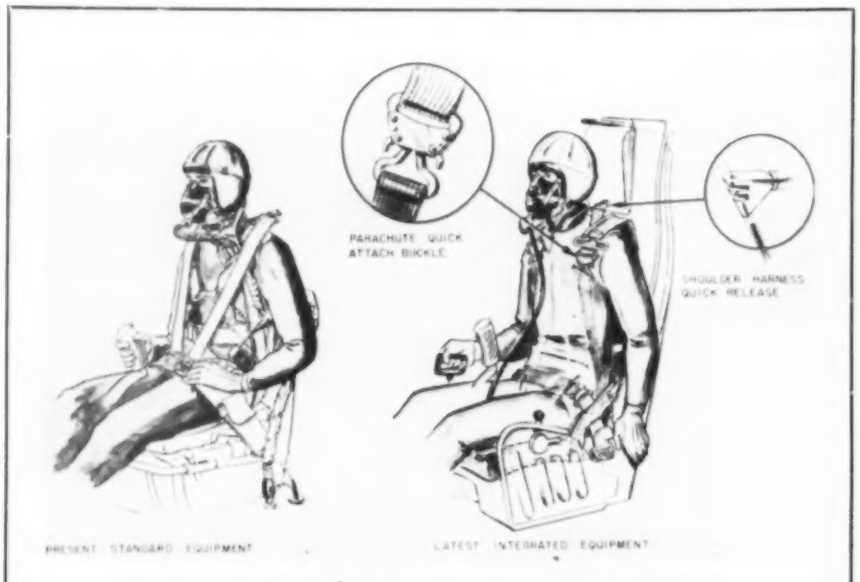
Bell Aircraft Corporation, which is producing military and commercial helicopters including a new tandem-rotor anti-submarine hunter-killer and which is developing a military convertiplane.

Amon Carter Field, the nation's newest model of modern air terminal planning.

Chance Vought Aircraft, just announced as winner of a recent military design competition for a new, lightweight day fighter, and producer of fighter and attack versions of the twin-jet Cutlass Navy fighter as well as Navy pilotless aircraft.

U. S. Naval Air Station at Hensley Field, where two events were staged. At a forum, discussions were by Dr. August Raspet, aerophysics director at Mississippi State College where world-famous motorless flight research includes development of suction airfoils, and by Fred Weick, director of the Personal Aircraft Research Center at Texas A. & M., who described significant developments in research with the AG-1 agricultural research aircraft. In an air show, the Navy established a new world record for loads carried by single-engine planes when one of its Douglas AD-4 Skyraider attack bombers took off before the writers at a gross weight of 26,739 lbs. — its 14,941-lb. useful load (including 10,500 lbs. in bombs) exceeding its basic weight of 11,798 lbs. Also in the air show, two Chance Vought F7U-3 Cutlasses staged ground-level speed runs at more than 600 mph., and agricultural aerial dusting, spraying and rice seeding were demonstrated by the AG-1, two Stearman dusters

*(Continued on page 74)*




**For Greater Pilot Safety, Comfort and Efficiency**

Sketched above are the old (left) and the new in Navy ejection seat, harness, flight suit and parachute as demonstrated last month in Dallas to the Aviation Writers Association. Integrated flight suit conceals harness for new thin-pack Switlik parachute. Only a few quick motions are required before take-off and a single-point release makes extrication instantaneous. Douglas Aircraft and the Navy worked together on the redesign and simplification project.

*Faster,*

*farther,*

*with a heavier striking load than*

*any known airplane of its weight or size*

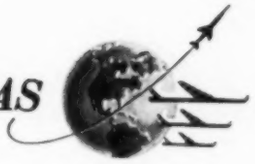
## —the U.S. Navy's Douglas A3D-1

Faster than many jet fighters, the Douglas A3D-1 can lift a bigger bomb load from an aircraft carrier and deliver it farther than any known plane.

First swept-wing jet attack bomber ever built for the Navy, A3D-1 is in the 600 to 700 mph class—and can operate on missions at 40,000 feet. Key to its speed, range, and striking power is the simplicity and lightweight strength of its Douglas airframe—which has already become a springboard for new configurations. A3D-1 has passed its early flight tests, and is already in production for delivery to the United States Navy.

Performance of the A3D-1 is another example of Douglas leadership in aviation. Developing planes that can be produced in quantity—*to fly faster and farther with a bigger payload*—is the basic rule of Douglas design.

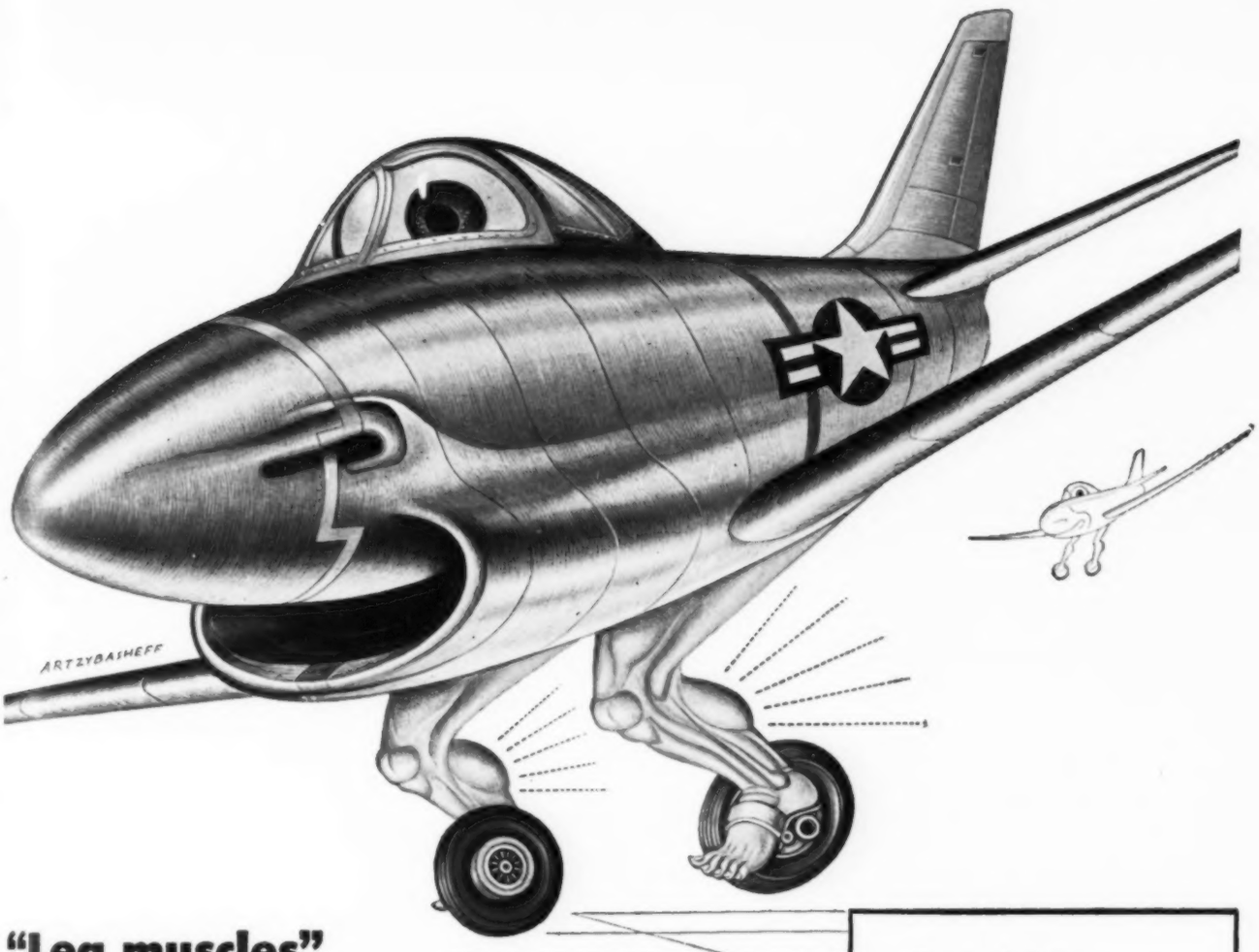
*Be a Naval flier—write to:*
*Nav Cad, Washington 25, D. C.*

**Depend on *DOUGLAS***  **First in Aviation**

# twice each week---

*A NEW AERO*
*COMMANDER*
*JOINS THE STAFF*
*OF ANOTHER*
*LEADING AMERICAN*
*BUSINESS CONCERN*

AERO DESIGN Commander
AERO DESIGN AND ENGINEERING COMPANY
TULAKES AIRPORT • OKLAHOMA CITY, OKLA.




# "Leg muscles" that cushion a jet's landing

When the landing gear of an F-86 Sabrejet hits the runway at lightning speed, the shock is absorbed by hydraulic action within the tough, precision-made cylinder on each "leg." To machine these 37-lb. cylinders to exact tolerances from solid 158-lb. steel forgings . . . to give them mirror-smooth inside finishes . . . Cleveland Pneumatic depends on Lycoming.

If *your* metal-working needs—like Cleveland Pneumatic's—can be solved by precision production, or if your problem is volume fabrication, or "just an idea" in the rough or blueprint stage—*look to Lycoming*. Long famous for metal-working skills, Lycoming meets the toughest specifications of exacting customers, both industrial and military.

**Lycoming's 2½ million square feet of floor space,** its more than 6,000 machine tools, and its wealth of creative engineering talent all stand ready to serve your needs.

*AIR-COOLED ENGINES FOR AIRCRAFT AND INDUSTRIAL USES • PRECISION-AND-VOLUME MACHINE PARTS • STEEL-PLATE FABRICATION*

*FOR RESEARCH · FOR PRECISION PRODUCTION*

**LOOK TO LYCOMING**

LYCOMING-SPENCER DIVISION, WILLIAMSPORT, PA.
BRIDGEPORT-LYCOMING DIVISION, STRATFORD, CONN.

**For main leg cylinders that enable a Sabrejet to absorb the jolt of high-speed landings—Cleveland Pneumatic looks to Lycoming's precision production**

**Lycoming-Spencer Division**
**AVCO Manufacturing Corp.**
**652 Oliver Street**
**Williamsport, Pa.**

Please send me further information on Lycoming's varied abilities and facilities.

Name_____

Firm_____ Title_____

Address_____

City_____ Zone____ State____

# Airport With a Future

## Many features make Amon Carter Field's terminal the world's finest

WORLD'S finest is the title experts are giving the $4,000,000 terminal building at Amon Carter Field, the newly-opened Greater Fort Worth International Airport. While far-sighted planning such as protective zoning in a 5-mile radius went into its landing area, its terminal building and ramp distinguished it as an outstanding model of functional design and operational efficiency.

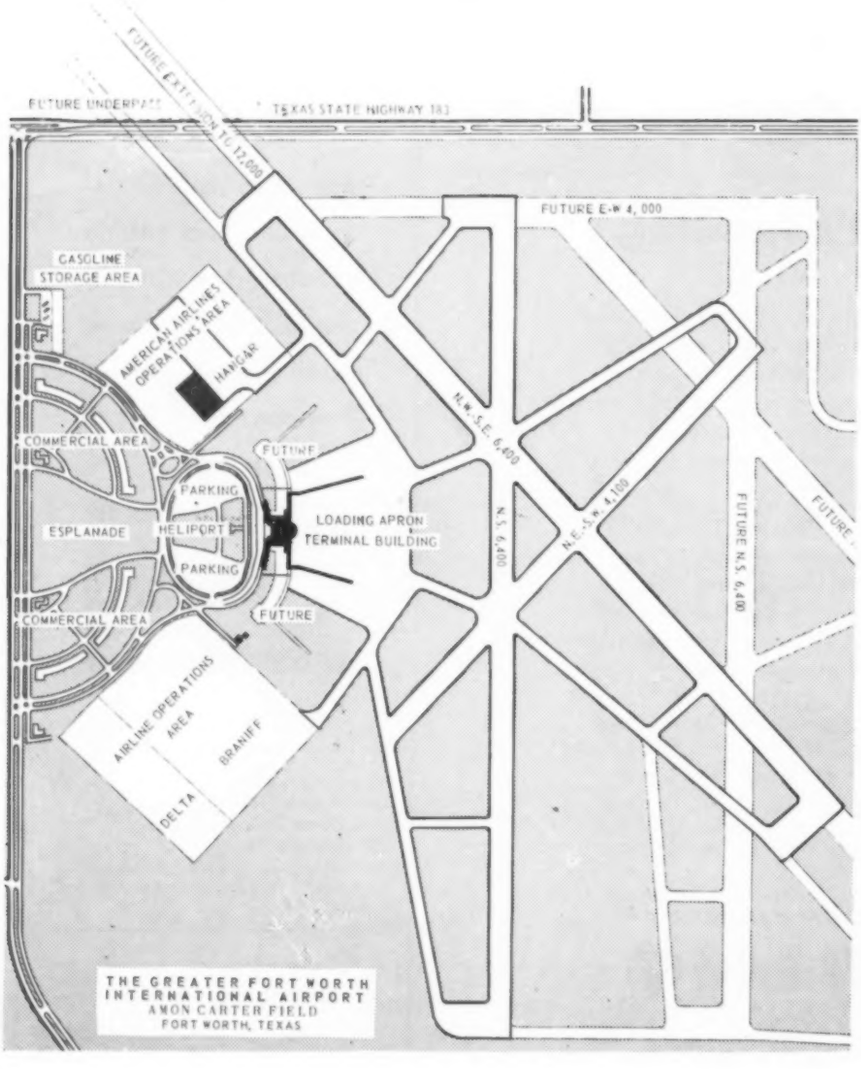
But having the title is one thing and making the most of it is another. The latter involves a tussle for traffic with Dallas, the airport being intended to serve both Fort Worth and Dallas city centers from a distance of 17 miles to each. The difficulty in bringing this about springs from the fact that the bulk of the two-city traffic is generated by Dallas. With a large investment already in Love Field, Dallas recently voted a $12,500,000 airport improvement bond issue and launched a fight to retain all possible Love Field schedules.

Despite all this, Fort Worth's remains as the "airport with a future" because the $13,000,000 Amon Carter Field, unlike Love Field, was planned that way from the beginning. While Love Field has become surrounded by built-up areas, all approaches to the 1,780-acre Amon Carter Field are prairie-clear and zoning of a 5-mile radius will keep approaches clear on a 50-to-1 or 100-to-1 glide angle. Two 6,400-ft. runways and one 4,100 ft. long can be lengthened at will and the main runway is to be lengthened to 12,000 ft. for jet traffic. High-intensity approach and runway lights are used.

As expressed by Amon G. Carter, Fort Worth newspaper publisher and long-time aviation supporter for whom the airport was named, the new facility will be "operated as a business by businessmen." He heads a group of 23 business leaders who incorporated an operating company, Fort Worth Air Terminal, Inc., which leased the airport from the city for 36 years. Maury H. Huffman is executive director.

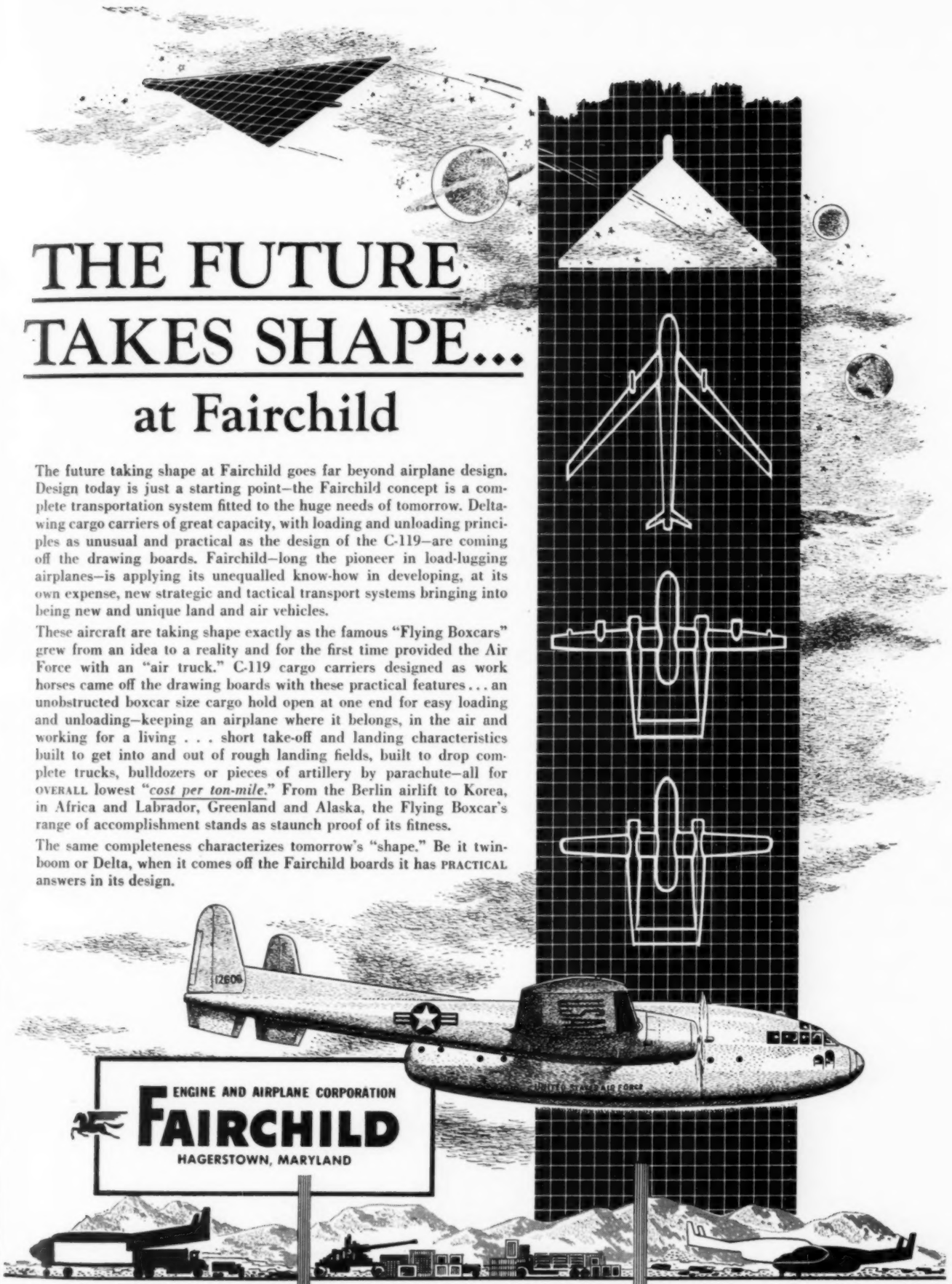
Plans call for development of a complete surburban center at the site, including a hotel, shopping center, recreational area for airport employes and other projects. The telephone exchange is officially designated as "Airport, Texas."

*(Continued on page 74)*




**Layout of $13,000,000, 1,780-acre Amon Carter Field shows completed construction in black. Black fingers extending from terminal into loading apron are passenger concourses alongside which 17 four-engine airliners can be serviced simultaneously. Two-level operations at terminal segregates passengers from servicing activities. Passengers are ticketed in street-side south wing. Baggage claim counter is in north wing. Hydrant fueling system with pipelines eliminates gas trucks.**

—(Ft. Worth Air Terminal Drawing.)



# THE FUTURE TAKES SHAPE...

## at Fairchild

The future taking shape at Fairchild goes far beyond airplane design. Design today is just a starting point—the Fairchild concept is a complete transportation system fitted to the huge needs of tomorrow. Delta-wing cargo carriers of great capacity, with loading and unloading principles as unusual and practical as the design of the C-119—are coming off the drawing boards. Fairchild—long the pioneer in load-lugging airplanes—is applying its unequalled know-how in developing, at its own expense, new strategic and tactical transport systems bringing into being new and unique land and air vehicles.

These aircraft are taking shape exactly as the famous "Flying Boxcars" grew from an idea to a reality and for the first time provided the Air Force with an "air truck." C-119 cargo carriers designed as work horses came off the drawing boards with these practical features . . . an unobstructed boxcar size cargo hold open at one end for easy loading and unloading—keeping an airplane where it belongs, in the air and working for a living . . . short take-off and landing characteristics built to get into and out of rough landing fields, built to drop complete trucks, bulldozers or pieces of artillery by parachute—all for OVERALL lowest "*cost per ton-mile*." From the Berlin airlift to Korea, in Africa and Labrador, Greenland and Alaska, the Flying Boxcar's range of accomplishment stands as staunch proof of its fitness.

The same completeness characterizes tomorrow's "shape." Be it twin-boom or Delta, when it comes off the Fairchild boards it has PRACTICAL answers in its design.

ENGINE AND AIRPLANE CORPORATION

**FAIRCHILD**

HAGERSTOWN, MARYLAND

**EASE OF LOADING** — typical of the combat-proven C-119, is basic in the design features of tomorrow's practical and daring Fairchild shapes to come.

**ANY TYPE OF MILITARY LOAD** will be carried in future Fairchild "shapes"—a feature incorporated as a *must* for future military flexibility.

**MINIMUM TURN-AROUND TIME** is basic engineering in all "shapes to come" so that mission of the future will have the lowest "*cost per ton-mile*."

*Heat and pressure combine to form a perfect weld.*

# Here's how we get more perfect welds

To join the separately forged turbine wheel and shaft of a jet engine into one integral part, this specially designed flash welding machine heats the joint electrically to fusing temperature. Then, under 120 tons' hydraulic pressure, the two parts are welded into a perfect unit.

This unique automatic welding process—the most uniform and economical method known—is applied by Allison engineers to get stronger, more perfect welds. It eliminates the air pockets, voids and slag common to manual welds. Not one of the thousands of welds made with this machine has failed in service.

Painstaking care in all stages of Allison engineering and production is one of the many reasons for the continuing improvement in the already superior performance of Allison jet engines.

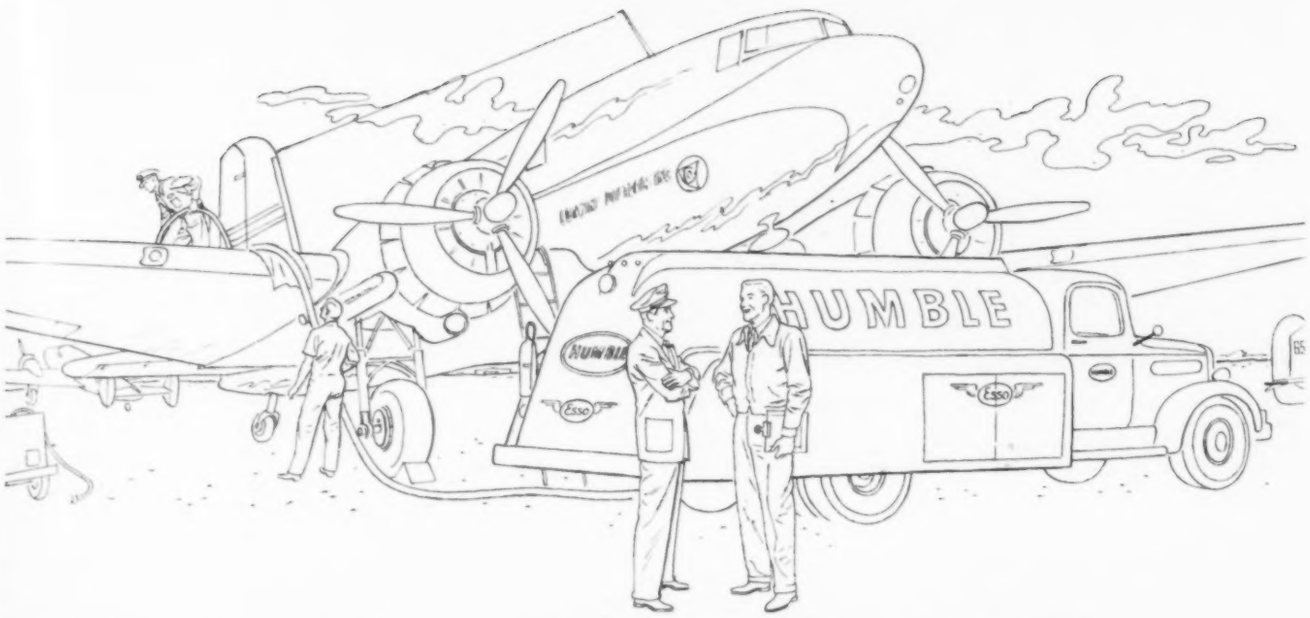
*Lowering J33 turbine wheel and shaft into special flash butt welding machine.*

GM GENERAL MOTORS

Allison

DIVISION OF GENERAL MOTORS
INDIANAPOLIS, INDIANA

***World's most experienced designer and builder of aircraft turbine engines*** — J35 and J71 Axial, J33 Centrifugal Turbo-Jet engines, T38 and T40 Turbo-Prop engines




# Preferred by pilots on Texas Skyways

# Humble Esso Aviation Gasoline

Both pilots who fly for pleasure and those who fly for business have changed to Humble Esso aviation products in such increasing numbers that *Humble leads in commercial aviation gasoline sales in Texas.*

The reason? Humble Esso fuels and lubricants are dependable. They have been continuously improved by continuing studies of aviation requirements; they are products of the highest practical quality. Skyways or highways—stop for service under the Humble sign!

**Use your Humble Esso Aviation Credit Card at more than 600 airports across the nation.**

**HUMBLE OIL & REFINING COMPANY**

**CANADIAN AVIATION INDUSTRY'S WORLD AMBASSADOR** is the de Havilland Beaver, now in the service of 26 countries. Above is the 500th Beaver, recently delivered from Toronto to the government of the Falkland Islands, South America. C. H. (Punch) Dickins of de Havilland's Canadian factory handed No. 500 over to its purchasers. —(de Havilland Photo.)

## AMON CARTER FIELD

*(Continued from page 70)*

In front of the terminal are extensive free auto parking lots and a heliport, the latter being the first ever incorporated in an airport's original planning. It is 450 ft. long and 150 ft. wide, having a 42-ft. triangular touch-down pad and 12-ft. concrete drive. Fenced, it can accommodate 12 helicopters simultaneously with traffic directed from the airport control tower atop the terminal building, which separates the heliport from the airport ramp. Several applications for helicopter passenger and mail operations have been filed.

Basic feature of the terminal building is its design for two-level operation separating passenger and ramp activities. This is carried out from street-side to aircraft. Approaching in an auto, a passenger may leave his car in an indoor parking garage on the ground floor or be driven up an inclined roadway alongside the second-floor airline ticket-counter wing at the south end of the terminal. Inside are 208 feet of ticket counters, each airline having its own entry door with identifying sign. Passengers departing from airlines leave from the opposite or north wing, where baggage claim counters are located.

While being ticketed, a passenger sees his baggage placed on a conveyor which carries it below to the ground floor for loading. A central public address system control room makes all announcements, utilizing 499 loudspeakers which may be individually controlled for paging. Trained women announcers are used and music is dispensed between announcements.

Just as the huge lobby separates the flow of traffic to airplanes and from airplanes, it also separates ticket counters from passenger concourses to the airplanes. Each passenger has to pass through the lobby, which is 180 ft. long, 60 ft. wide and has a 31-ft. ceiling. Custom furnishings create a hotel-like atmosphere in the lobby, which is ringed by concessions—gift shops, dining room and coffee shop, flower shop, apparel shop, toy shop, Western Union agency, telephones and an auto rental agency. A staff of terminal building hostesses is on duty for assistance and the lobby has a Traveler's Aid room and other facilities. Duplicate rest rooms are on both sides of the lobby and shower facilities are provided.

Passenger concourses lead from each end of the lobby to two-level loading "fingers" which extend at angles from the terminal onto the aircraft ramp. Stairs are eliminated by the use of escalators, seven of which are for passenger use in the concourses. Planes are parked on both sides of each "finger", two at each gate. Seventeen four-engine airplanes can be parked, loaded and unloaded simultaneously. Plans allow for this number to be doubled when necessary with the addition of "fingers" as required.

An underground pipeline fueling system eliminates the need for gas trucks. Sixty-eight hydrants provide connections between pipeline and aircraft. Two concrete tunnels, 8 ft. high and 7.5 ft. wide, run the length of the terminal building basement and the loading fingers. These carry underground services such as air conditioning to parked planes. Provision in them has been made for future telephone, water, electricity or pneumatic tube services for parked aircraft.

Special planning has gone into baggage handling. The claim baggage section in the north wing on lobby floor level has a 100-ft. counter. Electric trucks transport baggage up to the counter and return to ground level via a "down" ramp. Director Huffman says baggage is moved from the most distant gate to the counter in 2 mins. 40 secs. This allows three stops for opposing traffic, if any, along the way.

### Terminal Building Data

Size: 242,000 sq. ft. of floor space, completely air conditioned.

Ground Floor: Outgoing baggage work area 180 ft. by 40 ft.; 6,000 sq. ft. for U. S. air mail post office; 7,200 sq. ft. for air freight and cargo; barber shop; beauty salon; catering kitchen; employes' cafeteria; concessionaire's storage areas; wash rooms for maids and porters; airline operations offices and ramp equipment storage in concourses; 200-car indoor parking garage; modern fire station fully equipped and manned; maintenance shops and stores; automatic telephone exchange.

First Floor: 208-ft. airline ticket counters; public address system control room; 10,800-sq. ft. lobby; concessions; circular dining room seating 225 persons; coffee shop; spectators' gallery for 500 persons; rest rooms; aid rooms; seven escalators in concourses; 100-ft. baggage claim counter.

Second Floor: Airport private club for members only; private dining rooms; outdoor dining terrace; Weather Bureau offices; CAA, city and terminal offices. ★ ★ ★

## AVIATION WRITERS

*(Continued from page 66)*

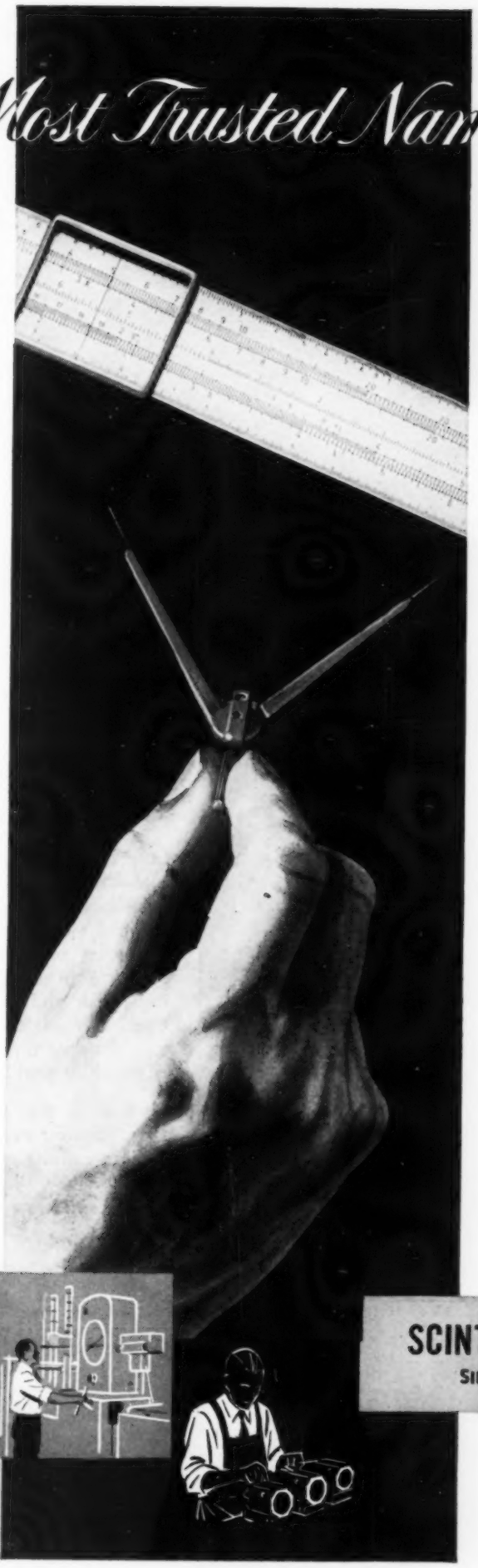
and a Piper Super Cub. Texas A. & M., 4th Region CAA, Piper Aircraft and Tunnell Aircraft Service of Dallas cooperated in the aerial cropping show. The Texas Soaring Association presented a sailplane demonstration by Wally Wiberg.

At Love Field in Dallas, the writers witnessed a display of executive aircraft at Southwest Airmotive, these planes including Aero Commanders, Beechcrafts, Cessnas, Pipers, Riley Twin Navion Conversions, Lockheed Lodestars, de Havilland Doves, Mooney Wee Scotsman, Douglas DC-3's and others. Facilities of Dallas Airmotive, including silent engine tests stands, were inspected.

Collins Radio's Dallas plant, Texas Instruments, Temco's overhaul and modification services and production of Riley Twin Navion Conversions at Greenville, and Randolph Field in San Antonio were also viewed.

Ralph Platt, Cleveland (Ohio) "News" aviation editor, was re-elected president of AWA. Al Harting of Southwest Airmotive was chairman of the host committee on arrangements. ★ ★ ★

# *The Most Trusted Name in Ignition*



## in research, design and manufacturing

For over a quarter of a century, Bendix has set the pace in meeting the ever changing ignition problems of the industry. It is perfectly obvious that solutions to this perpetual challenge of product improvement and application can only be found by an unceasing search for advanced design, better materials and more efficient manufacturing methods.

How well Bendix has met this challenge is evidenced by the overwhelming endorsement the aviation industry has given to Bendix ignition equipment.

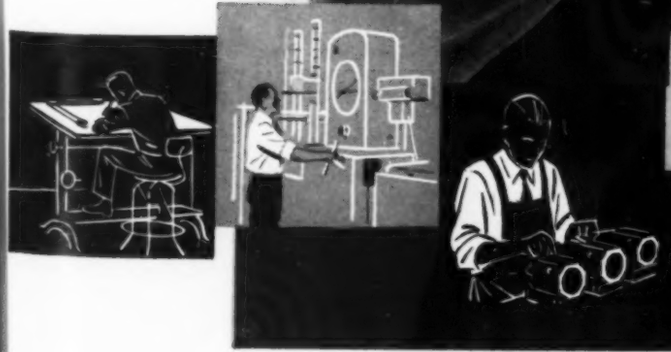
Whether the requirement is for a better electrical connector or a complete new ignition system, the industry has come to look upon Bendix as the one source best qualified to meet every ignition problem.

Remember, the unmatched facilities of Bendix are yours to command from planning to finished product.

**AVIATION PRODUCTS**

**Low and high tension ignition systems for piston, jet, turbo-jet engines and rocket motors . . . ignition analyzers . . . radio shielding harness and noise filters . . . switches . . . booster coils . . . electrical connectors.**

Bendix



**SCINTILLA MAGNETO DIVISION**
**SIDNEY, NEW YORK**

**Export Sales: Bendix International Division**
**72 Fifth Avenue, New York 11, N. Y.**

***FACTORY BRANCH OFFICES:*** **117 E. Providencia Avenue, Burbank, California • Stephenson Building, 6560 Cass Avenue, Detroit 2, Michigan • Brouwer Building, 176 W. Wisconsin Avenue, Milwaukee, Wisconsin • 582 Market Street, San Francisco 4, California**

*Announcing*

# THE NEW PIONEER GUIDE SURFACE PERSONNEL PARACHUTE the P7-B* and P9-B*

**The Pioneer Parachute Company has always geared its research, development and manufacturing to keep pace with the ever progressive and challenging aviation industry.**

**Pioneer has always been in the forefront with new ideas in parachute design and construction and has presented them to the world only after rigid testing and proven performance.**

**In presenting the P7-B* and P9-B*, Pioneer is certain that this new Guide Surface Personnel Parachute is a significant step forward in meeting the problems presented by high aircraft speeds — practically eliminating opening shock and oscillation during descent. A flyer's descent is virtually straight down, landing on his feet in a standing position.**

**Pioneer is the exclusive commercial manufacturer of this new parachute and can make reasonably timely deliveries.**

***Patents applied for in U. S. and principal countries throughout the world.**

**PIONEER PARACHUTE CO. INC.**
MANCHESTER, CONNECTICUT, U.S.A.
CABLE ADDRESS: PIPAR, Manchester, Conn. U.S.A.

**Southwest Factory Branch**
**Love Field**
**Dallas, Texas**

# Designed from Experience..

It takes experience to design today's modern high speed aircraft, and TEMCO Aircraft Corporation has it.

TEMCO engineers, both supervisory and non-supervisory, can point with pride to one of the highest average levels of aircraft design experience in the industry. Drawn from all parts of the country, they have been associated with the design of many world famous aircraft, both civil and military.

Typical is the Design Staff where the average experience for each man on the staff is 18 years. In the Alighting Gear Group the figure comes to 7 years; in the Flight Test Group to 11 years; and in the Power Plant Group to 9 years.

Today TEMCO has integrated these years of experience into a coordinated team, and is applying its multi-million hours of engineering know-how toward the design of turbine powered trainers and first line combat aircraft for our military services.

**TEMCO IS A GOOD PLACE TO WORK**

And, there's a big aircraft future for TEMCO employees.

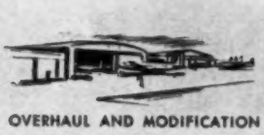
TEMCO

AIRCRAFT CORPORATION

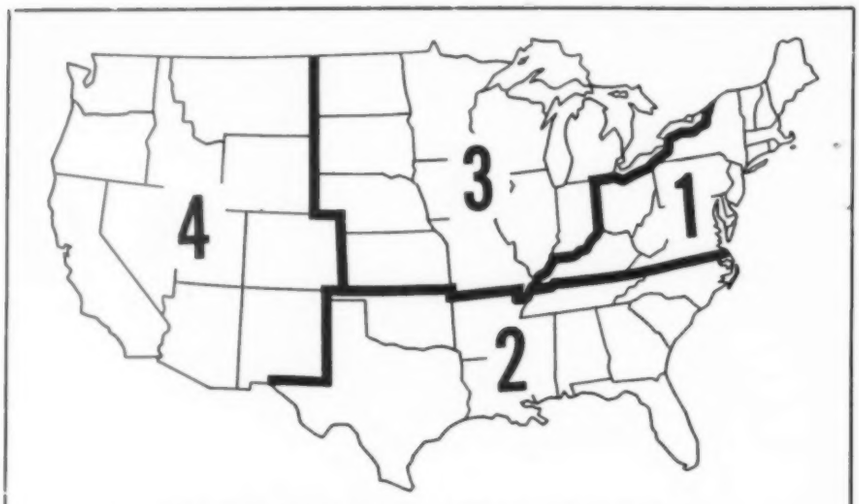
ONE OF AMERICA'S MAJOR AIRCRAFT MANUFACTURERS

AIRCRAFT MANUFACTURING

MAJOR SUB-CONTRACTING



OVERHAUL AND MODIFICATION




## CAA Reorganized in Wholesale Shake-up

RE-SHUFFLING of the Civil Aeronautics Administration organization in the field has begun with the first step a reduction in the number of regional offices from seven to four, as indicated on the map above. Most far-reaching CAA shake-up since its formation, it is supposed to save $1,500,000 annually and was ordered by new CAA Administrator Fred B. Lee as an "economy move" in keeping with the new Republican administration's economy promises.

Eliminations are regional offices in Atlanta, Chicago and Seattle. Regional offices and administrators in the new set-up are at Region 1 New York, Ora Young; Region 2 at Fort Worth, L. C. Elliott; Region 3 at Kansas City, L. W. Jurden, and Region 4 at Los Angeles, J. S. Marriot. Full details of the shake-up, involving up to about a thousand job eliminations, have not been learned. Several thousand other personnel will be affected by wholesale transfers and shiftings. Herbert H. Howell has replaced Phillips Moore as director of airports in Washington, with Moore assuming Howell's former duties as special adviser to the administrator.

## AIR REPORT

*(Continued from page 8)*

can be attained by eliminating acoustic resonance in the combustion chambers, said to cause many rocket motor explosions and violent, irregular firing.

**SUCCESSFUL COMPLETION OF A 50-HOUR MILITARY FLIGHT RATING TEST** has been announced by American Helicopter Company for its Model AJ-7.5-1 pulse jet engine, which will power the XH-26 helicopter. . . . **A NEW RAM-AIR TURBINE** that supplies emergency hydraulic power for jet aircraft has been announced by AiResearch.

**FIRST TEMCO-PRODUCED RILEY TWIN-NAVION CONVERSION** has been delivered. Ben Bransom, Dallas dealer for the Riley Twin, said he has flown a Temco-built Riley Twin and reported it cruised at 166 mph. at 4,000 ft. With one of the Hartzell props feathered and at near gross weight, it trued out at 123 mph. at 4,200 ft. on one engine, he said.

**LOCKHEED HAS LAUNCHED A GROUP OF ENGINEERING SCIENTISTS** on a study of aviation trends 10 to 25 years in the future. It is headed by L. Eugene Root, director of Lockheed's new development planning department which will work at top corporate levels and report directly to Hall Hibbard. Research will include family-type planes of the future, it was indicated.

**BEECHCRAFT'S NEW VICE PRESIDENT IN CHARGE OF MANUFACTURING** is C. C. (Chet) Pearson, until recently vice president of operations of the Glenn L. Martin Company and formerly with Douglas Aircraft for 16 years.

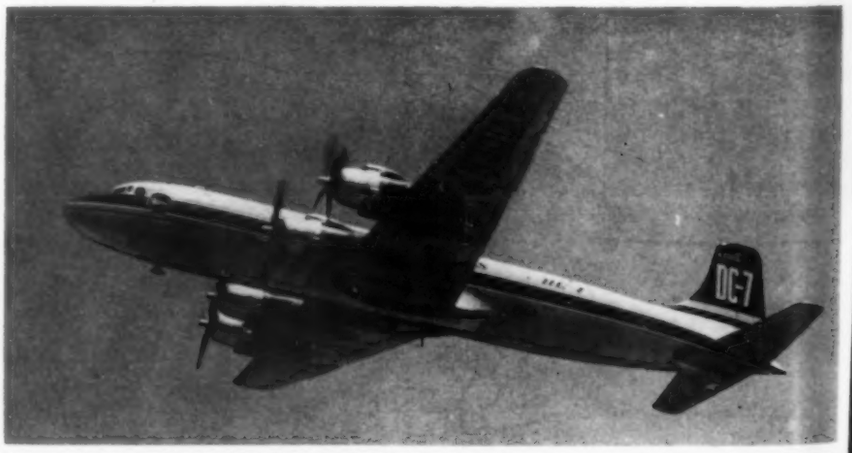
**NEWEST AERO COMMANDER DISTRIBUTOR** is Aero-Ways, Inc., of Cleveland, an Ohio aviation sales and service organization since 1929. Headed by Ted E. Byron, Aero-Ways operates two hangars at Cleveland Municipal Airport.

**AMERICAN JET ENGINES HAVE OVERTAKEN BRITISH JET ENGINES,** H. M. Horner, United Aircraft Corporation president, said last month. "We have in production at this time advanced American jet-turbine power plants that are definitely ahead of any known foreign competitor, including the British," Horner said. "Ours have higher thrust and considerably better fuel economy."

**A NEW AND MORE POWERFUL SABRE JET** fighter is being flight tested—the North American F-86H. It is powered by the new General Electric J-73, and is a dual-purpose combat plane for fighter-bomber and day-fighter missions.

**THE 6TH ANNUAL INTERNATIONAL AVIATION EXPOSITION** at Detroit's Wayne County Airport July 9-12 will feature an air show with military and commercial flying demonstrations emphasizing 50 years of air progress. Each military service will be allowed at least 30 minutes of flying time in the air show, says James V. Votta, general manager. A quarter-mile-long "golden promenade of progress" will feature exhibits of aircraft components, and it will be surrounded by scores of aircraft including early types and latest models. Several long-distance flights will land and take off from Detroit. A special exhibit will feature planes used by farmers, prospectors, cattle ranchers, construction firms and other businesses.

**PRATT & WHITNEY J-57 AXIAL-**




**FIRST FLIGHT PHOTO OF NEW DOUGLAS DC-7** shows the new airliner aloft at Santa Monica on May 18. Powered by four Wright R-3350 turbo-compound engines delivering 13,000 take-off horsepower, it is 8 ft. longer than DC-6, seats 69 to 96 passengers, and has a 365-mph. cruising speed with 4,420-mile absolute range on 5,512 gals. of fuel. Gross weight is 122,200 lbs. with 20,000-lb. payload. Landing gear extension at high speeds will serve as a dive brake. Chief Test Pilot John F. Martin and his assistant, Bert Foulds, made the first flight. Fifty-eight DC-7's are on order. This one goes to American Airlines. —(Douglas Photo.)

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**1 LINE SERVICE**
You will appreciate the prompt attention our line personnel gives you as well as the many extra services and accommodations we offer.

**2 100-HOUR CHECKS**
The J. D. Reed Company is geared for complete 100-hour checks when your aircraft is idle between flights.

**3 MAJOR OVERHAULS**
Our factory trained staff, using the finest and most complete equipment will put your aircraft in like new condition.

**4 PROPELLER SERVICE**
When your needs warrant propeller service you will find the J. D. Reed Company ready to give you immediate service.

**5 ENGINE SERVICE**
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A complete stock of parts and accessories are maintained for your needs at all times eliminating unnecessary delays.

**7 CUSTOM RADIO INSTALLATIONS**
For years the J. D. Reed Company has specialized in designing the type radio installation that will provide the best results under all conditions.

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Reed custom executive conversions offer the ultimate in beauty and transportation providing maximum utility at the most reasonable initial cost.

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*The Beechcraft of today was designed for comfortable long-range flying with many days away from home base. But service for your Beechcraft will not vary if you stop at the sign of BEECHCRAFT CERTIFIED SERVICE.*

*At BEECHCRAFT CERTIFIED SERVICE STATIONS you will find skilled and efficient Beechcraft factory trained personnel, adequate equipment and facilities, factory authorized parts and accessories plus economical prices.*

**To obtain the best service for your Beechcraft and for prompt attention to maintenance and overhaul requirements, visit the Certified Beechcraft Service Stations listed.**

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**ATLANTIC AVIATION CORP.**
Teterboro Airport, (25 minutes from Times Square)
Teterboro, New Jersey
Logan Airport, East Boston, Mass.

**ATLANTIC AVIATION SERVICE**
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**BUTLER CO., AVIATION DIVISION**
Municipal Airport, Chicago, Ill.

**CURREY SANDERS AIRCRAFT CO., INC.**
Downtown Municipal Airport, Shreveport, La.

**CUTTER-CARR FLYING SERVICE, INC.**
West Mesa Airport, Albuquerque, New Mexico

**GRAY AIRCRAFT SVC. CO., INC.**
D. A. Cody, Service Mgr.
Love Field, Dallas, Texas

**HUNTER FLYING SERVICE, INC.**
Hunter Field, Cedar Rapids, Iowa

**ROD MORE AVIATION SERVICES**
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Corpus Christi, Texas

**OHIO AVIATION COMPANY**
Dayton Municipal Airport, Vandalia, Ohio

**PACIFIC AIRCRAFT SALES CO.**
Oakland Airport, Oakland, California

**ROSCOE TURNER AERONAUTICAL CO**
Municipal Airport, Indianapolis, Ind.

**J. D. REED CO., INC.**
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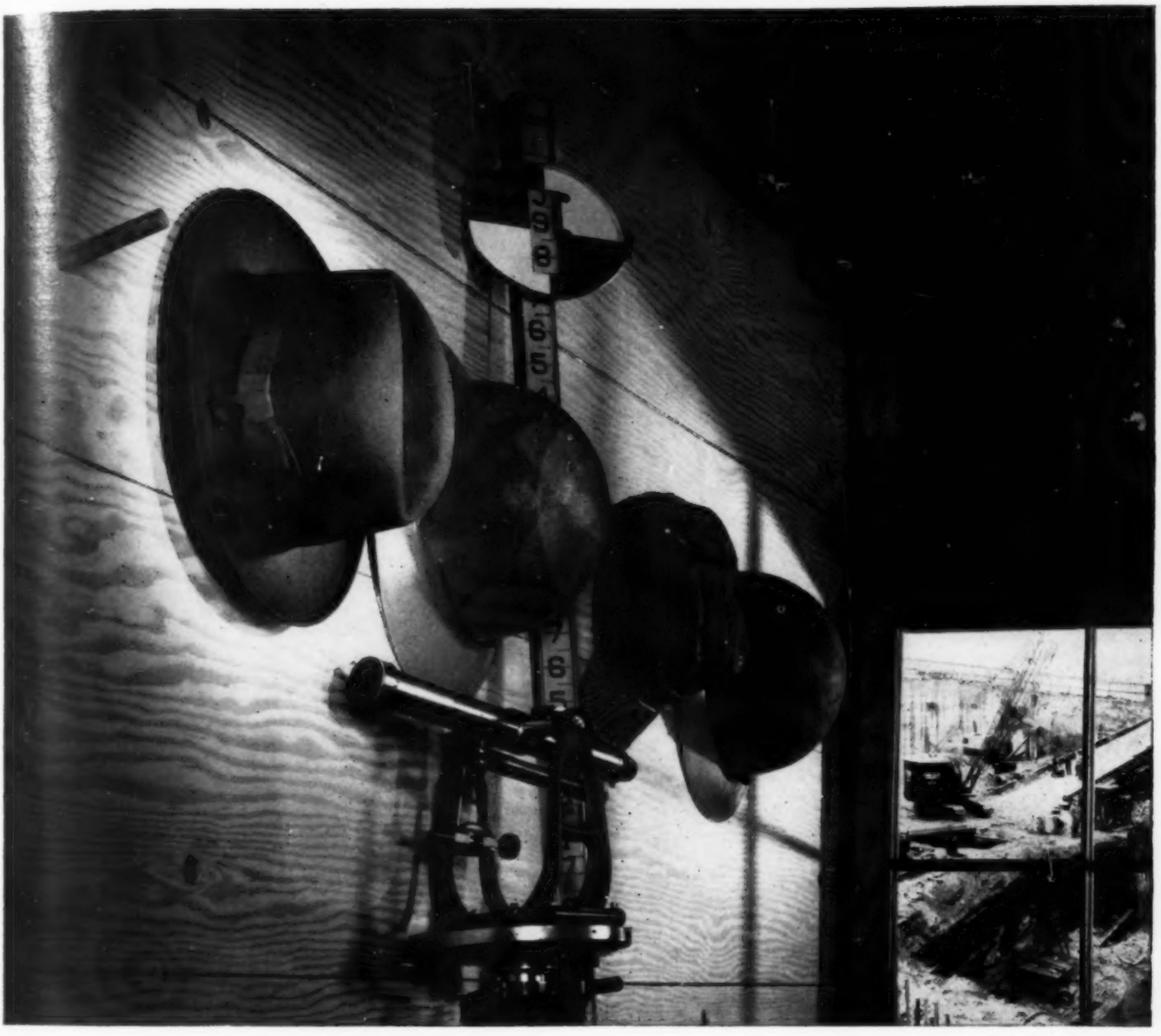
**SOUTHERN FLIGHT SERVICE, INC.**
Douglas Municipal Airport, Charlotte, N. C.

**TOPEKA AIRCRAFT SALES & SERVICE**
Municipal Airport, Topeka, Kansas

**TRADEWIND AIRPORT CORP.**
Tradewind Airport, Amarillo, Texas

**TULSAIR DISTRIBUTORS, INC.**
Hangar 5, Municipal Airport, Tulsa, Oklahoma

**WINGS, INCORPORATED**
Wings Field, Ambler, Pennsylvania
Philadelphia International Airport, Philadelphia



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Distant field trips, on-the-spot expediting, and complete mobility of action are routine with a company-owned Beechcraft Executive Transport. You cut your get-there time as much as 75 per cent—and you're back before you're missed. It's travel as travel *should* be: fatigue-free, comfortable, relaxing—and completely at *your* convenience.

Beech "Twins" serve thousands of firms profitably in just this manner every working day. You owe it to yourself to investigate Beechcraft ownership. Typical costs and operating data on request.

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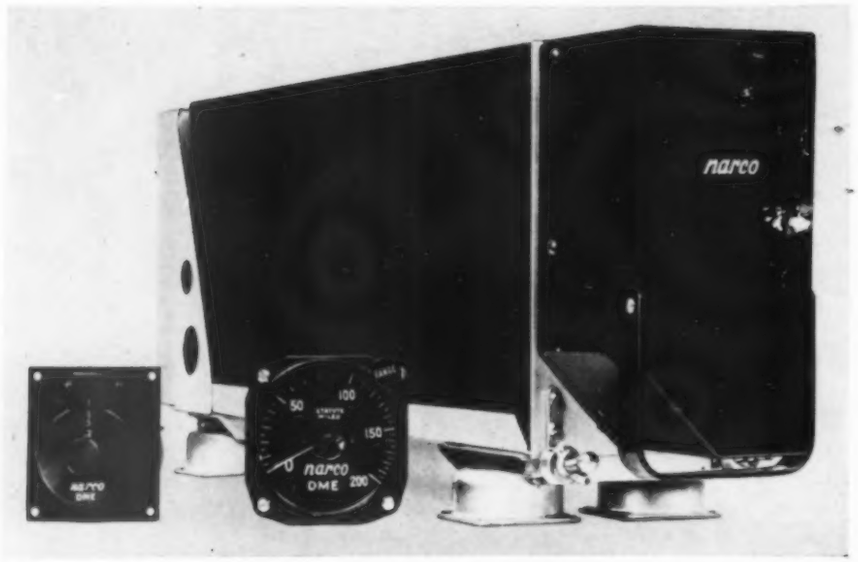
Call your Beechcraft distributor or write Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

*BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS*




**NARCO DISTANCE MEASURING EQUIPMENT FOR EXECUTIVE AIRCRAFT AND AIRLINES** was unveiled last month by National Aeronautical Corp. The complete airborne interrogator weighs only 30 lbs. The DME operates in the UHF 960-1,215-megacycle range to compute distances from zero to 200 miles. The equipment transmits a series of radar impulses which are received at ground VOR or ILS stations, from which a transponder sends back reply signals. The Narco equipment automatically computes from these and indicates on the instrument dial the exact distance in miles between the airplane and the station. It also features a 0-to-20-mile approach scale and a special flashing light to positively identify a transponder. It will be available later this year.
—(Narco Photo.)

**PROPER SPEED FOR TAKE-OFF, CLIMB OR LANDING APPROACH** is indicated by this new instrument developed by Safe Flight Instrument Corp., White Plains, N. Y. It automatically takes into consideration load, acceleration, flap position and turbulence. Centered pointer shows proper speed. It is intended primarily for use on transport, military and executive aircraft. Less than 3 lbs. in weight, the system includes a sensing unit below the wing's leading edge at the "stagnation point" where it continually measures wing lift coefficients. Thus it indicates aerodynamically-perfect speeds.
—(Safe Flight Photo.)

**FLOW JET ENGINES** will power Boeing Airplane Company's new prototype jet transport now under construction and slated to fly in 1954.

**LARGE ATTENDANCE IS EXPECTED FOR THE AVIATION DISTRIBUTORS AND MANUFACTURERS ASSOCIATION'S** mid-year meeting at Chateau Lake Louise, Alberta, Canada, June 17-19, according to L. W. Trees, president.

**THE AUTOBIOGRAPHY OF A. W. (TONY) LEVIER,** Lockheed's famous chief engineering test pilot, has been accepted for publication by Harper & Brothers, New York book publishers. It is being written by John Guenther. Tony has been flying for 23 of his 40 years and has been flight-testing jets longer than any American pilot. His story is a "must" for anyone interested in jet flying and flight testing. . . . **PAN AMERICAN NAVIGATION SERVICE,** North Hollywood, Calif., has published the second revised edition of "Flight Engineers Manual" by Charles A. Zweng.

**RAOUL HAFNER** has received the Dr. Alexander Klemin Trophy for 1953, highest honor of the American Helicopter Society, for notable achievement in the advancement of rotary-wing aeronautics. He is chief helicopter engineer of the Bristol Aeroplane Co., in England. AHS also presented the Captain W. J. Kossler Award to the U. S. Marines for the year's greatest achievement in practical application or operation of rotary-wing aircraft" in recognition of helicopter assault tactics in Korea, and conferred honorary fellowships on two leaders—Dr. Kurt H. Hohenemser, McDonnell Aircraft's chief of helicopter aerodynamics, and Dimitry D. Viner, Sikorsky Aircraft's chief test pilot.

**COLLINS RADIO COMPANY** has expanded its staff of field service engineers to assist in installations and modifications of airline navigation and communication equipment. . . . **SLICK AIRWAYS IS INSTALLING COLLINS VHF EQUIPMENT** for its entire cargo fleet.

**MORE THAN 82,000 PERSONS ATTENDED THE OKLAHOMA CITY AIR FAIR** last month to make a big success of the nation's first celebration of the 50th anniversary of powered flight. There were 51 exhibitors in three hangars. Aviation education was the theme, with parents and children climbing into aircraft by using platforms. Stunt flying was prohibited. A new Piper Cub was given away during the 3-day program.

**A BOEING B-47 STRATOJET BOMBER** has flown more than 12,000 miles non-stop in 24 hours with three refuelings aloft, according to the Air Force. It carried a 10,000-lb. dummy bomb which was dropped at the halfway mark.

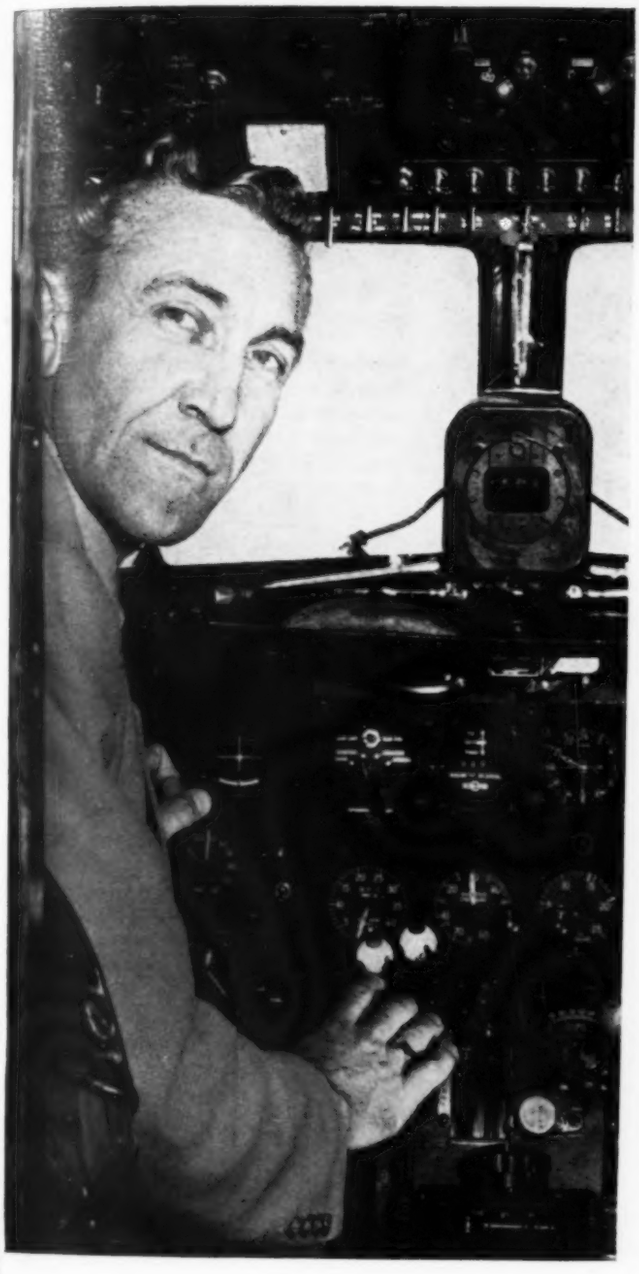
**WORLD'S FIRST SCHEDULED INTERNATIONAL HELICOPTER PASSENGER SERVICE** will be inaugurated Aug. 1 between Brussels, Antwerp and Rotterdam by Sabena Belgium Airlines. Sikorsky S-55's will be used. . . . **COMMERCIAL USE OF HELICOPTERS BY AIR FRANCE** is planned, with four to six Sikorsky S-55's as the first fleet.

**JACQUELINE COCHRAN** has been flying an F-86 built by and belonging to Canadair of Montreal and powered by a Canadian-built Avro Orenda jet engine. She is a consultant to Canadair. She flew the jet around a 100-kilometer closed course to average 652 mph. for a new world's record for this distance. She has also become the first woman to fly through the sonic barrier.

**SPARTAN AIRCRAFT COMPANY** at Tulsa is marking its 25th year of operation by changing the name of its aircraft repair organization and adding a new building. In the future, Spartan Aero Repair of Tulsa will be known as the Aviation Service Division of Spartan Aircraft Co. Capt. Maxwell Balfour will continue to direct the same staff for the overhaul or modification of industrial, military and private aircraft. He has been with Spartan 14 years. . . . **T. E. HUBBY** has sold the assets of United Aeronautics, Inc., of Mineral Wells, Texas, and closed down that business. He is now connected with Wichita Falls Air Transport Co.

**TEXAS SOARING ASSOCIATION** is back at Grand Prairie Airport, which the Navy has assigned to the Texas National Guard. Civil Air Patrol operations are also on the field.

**PERSONALS:** Harold Crary will retire July 1 as vice president of United Air Lines (sales) after 25 years with the company. He will continue with the company as a consultant. Crary's former duties will be assigned to R. E. Johnson, United's vice president and assistant to the president for advertising, public relations and related activities.



# Ask the men with the most experience...

## ask Ted Pavell

Chief Pilot, Allied Stores Corp., New York City

"**After 19 years** of flying, I guess I know the importance of consistent quality in aviation products," says Mr. Pavell, who's logged 6,000 hours. "I've seen how it pays off in terms of both dependable *performance* and money-saving *maintenance.*

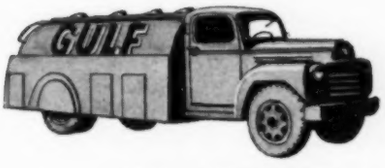
"Our DC-3 is flown extensively throughout the United States, Canada, Mexico and the West Indies. Under all flying conditions, we've found we can put complete trust in Gulf dependability.

"That's been our pleasant experience with Gulf Aviation Products for the last six years."

**Chief Pilot Pavell** at the controls of the DC-3 owned by Allied Stores Corp., operators of well-known department stores throughout the nation.

**For radial engines,** or where a detergent oil is not desired, Gulf Aircraft Engine Oil, Series-R is a top-quality, non-detergent, straight mineral lubricating oil—approved by Pratt & Whitney and other radial engine manufacturers for all types of service. It retards sludge and carbon formation and retains its body at high operating temperatures.

**For horizontally opposed** and Ranger in-line engines Gulfpride Aviation Oil, Series-D is the world's finest detergent-dispersant aviation oil. It minimizes ring- and valve-sticking, oil consumption, oil-screen clogging and plug fouling. Users of this great oil have actually increased periods between overhauls as much as 100%.

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With advanced Micronic Filters on Gulf Aviation Gasoline dispensing equipment, Gulf assures you of the finest possible quality—*plus*—the greatest possible *cleanliness.*

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Yes, all Piper models for '53 are terrific. The performance, flying ease and comfort will convince you why the flying public is so enthusiastic over the 1953 Piper line of fast, quiet and economical business planes. And there is a model to serve every purpose. Be sure to see and fly the new models at your Piper dealer or distributor now. You will agree that Piper is the terrific buy of '53.

• Ask one of the firms listed to demonstrate how one of the Piper models can save you valuable time and money. These firms are prepared to serve all your aircraft requirements.

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Municipal Airport
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**Oklahoma**

**SMYER AIRCRAFT SALES & SERVICE**
Municipal Airport
Ponca City

**Texas**

**BROWN FLYING SERVICE**
Municipal Airport
San Antonio

**JACK ROBINSON FLYING SCHOOL**
Meacham Field
Fort Worth, Texas

**SOUTHWEST AIR RANGERS**
International Airport
El Paso, Texas Midland, Texas

**WICHITA FALLS AIR TRANSPORT COMPANY**
Municipal Airport
Wichita Falls


## MORE POWER OR LESS DRAG?

*(Continued from page 59)*

There is another challenge — 450 years old — that still goes unheeded. This challenge also appears possible to meet due to numerous bits of information gleaned from our efforts to improve sailplanes. Leonardo da Vinci began thinking of flight as a result of his desire to emulate birds. He designed a muscle-powered flapping-wing airplane which he built and which was test flown. The results of the flight tests were not recorded. Suffice it to say that Leonardo made no further mention of flight in his notes except to state that his pilot suffered leg injuries. Today we know too little about flapping flight to attempt Leonardo's design. We do know, however, that we have progressively reduced the losses of our sailplanes so that were the sailplane RJ-5 to be redesigned to weigh at flight 250 pounds, this craft could fly on 0.56 horsepower, and the power output of man has been measured and found to be of 0.55 horsepower. We could therefore fly with muscle power alone if we had an efficient propulsion system.

### Design for Muscle-Powered Flight

However, it might be best to design a completely new muscle flight sailplane employing suction boundary layer control and light-weight structures. In order to permit an easy takeoff, the muscle power is coupled to a wheel which permits the craft rapidly to accelerate to takeoff speed at which point the propeller takes over. The hollow bladed-propeller is used also to provide suction by the boundary layer control. The turned down tips close in the flow which would spill over the tips, thereby reducing the drag at least until the sailplane gets some height above the ground.

From birds to muscle flight sailplanes, from personal aircraft to jet liners, is a wide range of flight, yet to each of these flight modes motorless flight research offers its philosophy of striving to understand the essentials of low energy loss flight. It is principally the desire to reduce power losses rather than to increase power which is the philosophy of motorless flight. We feel we are getting something for nothing when we soar. In getting this something, a little energy from the atmosphere, we try to waste as little of it as is technically possible. For this reason every effort is made to understand completely the behavior of the airflow around an aircraft. We cannot bluff our status by adding a few thousand more horsepower.

★ ★ ★

**Profitable Transportation.** More territory covered in less time at a passenger-mile cost of less than 2 cents. Little wonder thousands of business firms use Piper transportation.

**Fast, Economical Transportation.** Over 125 mph cruising speed, with dependable Lycoming 135 hp engine means swift transportation at cost comparable to auto—over 15 miles per gallon!

**Easy, Reliable Transportation.** Easiest to fly of all airplanes available today. The Tri-Pacer is spin-resistant, gives you peace of mind. Tricycle gear means simple landings even in cross winds.

**Pleasant Transportation** for the whole family. So many more places to go, so much more to see. Lots of room for lots of baggage, too, with the big new baggage compartment with outside door.

**Useful Transportation.** A roomy 4-place plane or spacious cargo carrier,—that's the Tri-Pacer, thanks to quickly removable rear seat and exclusive rear door for easy loading of bulky items.

**Quiet, Relaxed Transportation.** Sound-proofing and comfortable cabin make thousand mile-a-day trips easy. Simplified controls add to relaxation. And new radio aids make navigation so simple.

# Half a Million Miles of TRANSPORTATION!

When you buy a Tri-Pacer you buy a lot of transportation. In just 4,000 hours of flight (thousands of Pipers have exceeded this figure) a sleek Tri-Pacer rolls up over half a million miles of safe, comfortable, dependable transportation. No doubt you'll trade your Piper for a new one long before you fly it this much, but it's reassuring to know that even after one or two hundred thousand miles of dependable service to you, your Piper still has much good transportation left in it. Just one of many reasons why the Tri-Pacer or Pacer is a wise investment for farm or business.

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**PIPER AIRCRAFT CORPORATION**

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**MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD**

# Must Operators Be Fly-by-Nighters?

## More realistic airport lease arrangements would make better service operators

By GLENN J. DEGNER
Vice-president—Airports
National Aviation Trades Association

THE successful operation of any service-type business is always dependent upon two factors, aside from the ability of the organization to render a service acceptable to its customers. One factor is that of location or site value. The other factor is that of security of its location or site.

Even a cursory examination of the status of the average airport service operator with respect to these two essential aspects will automatically raise this question: Are airport authorities forcing operators to be "fly-by-nighters"?

Although there has been considerable discussion in aviation circles and a lot has been written about "fixed-base" or airport service operator leases, it is doubtful that either the industry or municipalities or public authorities owning airports have in the past realistically attacked the fundamental problems involved. However, in the past year more and more airport service operators have begun to worry seriously about their leasing arrangements. It is significant also that the Sixth Annual Wisconsin Aeronautics Conference has placed the subject high on its agenda, since the Conference is sponsored by an impressive array of representatives of public authorities, including the League of Wisconsin Municipalities, Wisconsin County Boards Association, Wisconsin State Chamber of Commerce and the Wisconsin State Aeronautics Commission.

### Typical Case

How, then, are airport authorities forcing the airport service operator to be a "fly-by-nighter"? What can both the operator and the municipality or authority owning a public airport do about a situation, which obviously is bad for both interests?

To answer these questions, we must first take a business-like look at what is financially involved in a typical airport operator setup. The asset side of the balance sheet of a sound operation should look something like this:

| | |
|---|---|
| Cash | $ 10,000.00 |
| Receivables | 12,000.00 |
| Parts inventory | 6,000.00 |
| Aircraft fuel and oil | 1,000.00 |
| Shop equipment | 5,000.00 |
| Furniture and fixtures | 3,000.00 |
| Airplanes | 25,000.00 |
| Building | 40,000.00 |
| Total | $102,000.00 |

In other words, what we are talking about is a business unit involving in round figures $100,000. Even in an era when everyone conversationally, at least, tosses around billions, a business involving an investment of $100,000 is not exactly in the "chicken-feed" class.

Now this typical operator must do a volume of business of at least $150,000 per year just to keep the doors open; and if he hopes to make a profit he will have to do between $175,000 and $200,000. His payroll, at a very minimum, will be between $35,000 and $40,000 per year. So it is obvious, from the standpoint of operation, the airport service operator is not dealing in small change.

Lest anyone take issue with the above brief outline of the business aspect of airport service operations, I hasten to point out that I am fully aware that there are a lot of operations much smaller and much larger than the above. However, in the case of those who are smaller, they will either not survive long or else will not be much of a factor in the business. In the case of a large number of operators who are much bigger than the typical I have outlined, their operations only serve to emphasize more emphatically the point I am attempting to make.

In any event, let us assume for purposes of argument that a good airport service operation involves a considerable investment and an operational expense commensurate with the investment required.

Now let's forget about the aviation business for a moment.

Suppose you yourself were in the process of establishing a business involving an investment of $100,000. What is one of the first requirements you would have in mind before making that commitment? Obviously, you would insist upon obtaining a tenure of the site which would enable you to recapture your investment and make a profit commensurate with the risk involved. This is axiomatic for any business.

Yet all too frequently this simple fundamental has been lost sight of in the case of the airport service operator. The responsibility rests with both the public authorities owning and administering airports as well as the airport operator himself. A third element has has not helped in the solution of the problem: the Civil Aeronautics Administration.

Let us look briefly at the problem from the position of each of the three interests involved. Before doing so, however, it should be observed in passing that there is comparatively little information assembled on airport leases. It is for this reason that the National Aviation Trades Association is in the process of carrying out an extensive survey to get factual information from operators on operating contracts they now hold. It is hoped

that the results of the information to be assembled will be of valuable assistance to the operator, public authorities responsible for letting contracts and the Civil Aeronautics Administration, particularly the legal division.

First of all, take the operator's position. To carry on a sales and service operation geared to meet the demands of the business-type personal airplane, aerial crop spraying and dusting, air taxi and charter and other industrial uses, the operator must have long-term security in his site. In some cases, hangar facilities are available on an airport which are owned by the public authority owning the airport. In other cases, he will find it necessary to build his own hangar facilities in their entirety. In still other cases, he will have to supplement existing hangar facilities by providing part of the building space himself. At the very least, it will be necessary to modify and alter existing buildings to meet the changing demands of the business. Unless he holds a long-term tenure on the site a responsible operator cannot be expected to make such a commitment.

### Lease Affects Financing

Moreover, capital through long-term loans is not available through established lending agencies, unless the operator holds title to the site or holds a lease providing comparable security.

If the public authorities owning and administering the airport property are unwilling or unable to enter into a contract with an operator to provide a sound basis to building up his operation on a long-range basis, then they force the operator to run his business on a "fly-by-night" basis. He must so run his business that he can recapture his capital quickly. He must make his charges to his customers accordingly. He must constantly have in his mind the necessity of either getting another location or renewing his existing contract. He cannot plan in terms of a long-range program or long-range commitments for the benefit of the community in which the airport is located or for himself and his organization.

In other words, the operator is "behind the 8-ball," unless he is permitted to purchase a site under terms which would make his property suitable collateral for a long-term mortgage; or unless he is granted a leasehold providing equal security.

Now take the position of the public authorities owning airports. Even an airport suitable for year-round operation of light aircraft requires an investment in the neighborhood of a quarter of a million dollars. Usually airports in cities of from 25,000 population upwards have a million or more dollars invested. Their thinking, which usually reflects the thinking of the taxpayers, in most cases is that the airport should be a "paying proposition," and their administrative policies reflect this thinking. They not only feel the operator should carry a large portion of the airport costs, but at the same time they are reluctant to give him very much leeway as far as security of site is concerned, just in case he does not turn out to be a good operator, in which event they want to be able to replace him with a minimum of difficulty.

In view of the fact that cities have always built streets, street lighting, storm sewers, schools, hospitals, parks and recreational facilities as a public service and not as direct profit-making facilities, it is difficult to understand why an airport should be regarded by the city government and taxpayers as a potential profit-making venture. In any event, in all too many cases the airport authorities by their very policies frequently make it impossible for the operator to aid substantially over the long-haul to make the airport profitable.

To complicate the problem further, it appears that the Civil Aeronautics Administration may ham-string airport authorities which have received Federal aid under the Federal Airports

# How to Get the Most Out of Your Cessna

Practically all Cessna owners today use their airplanes for the same reason — they need the most efficient and most flexible transportation available.

Hundreds of Cessna owners depend on the Authorized Cesna Service Stations listed below for their transportation needs — Authorized Cessna Service is their assurance that business planes are always ready to go, always in top condition for reliability, performance and comfort.

If you use your Cessna for important business needs, insist on Authorized Cessna Service at the Cessna Service Stations listed below. Their record for dependability and satisfaction is endorsed by the factory. Their long-established, factory-supervised Flat Rate Service guarantees every Cessna owner three important things:

1. You get an accurately quoted price and time-required quotation based on hundreds of job studies covering virtually all your maintenance needs.
2. You get genuine Cessna parts and factory-trained workmanship.
3. You save money and time and we stand behind every job for your fullest satisfaction.

More and more Cessna owners are recogn'zing the importance of these Flat Rate Service advantages.

To make the most of your Cessna's usefulness, visit the Authorized Cessna Service Stations listed below.

**These progressive Cessna Authorized Service Shops offer flat-rate service.**

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**Champ's Flying Service**
Municipal Airport
El Paso, Texas

**Clinton Aviation Company**
Stapleton Airfield
Denver, Colorado

**Dal-Tex Aviation, Inc.**
Highland Park Airport, Dallas, Texas

**Hair Flying Service**
Harding Field
Baton Rouge, Louisiana

**Howard Aero Service**
San Antonio International Airport
San Antonio, Texas

**Ragsdale Flying Service**
Municipal Airport
Austin, Texas

**Southwestern Skyways, Inc.**
New Municipal Airport
Santa Fe, New Mexico

**Kenneth Starnes Aviation Service**
Adams Field; Little Rock, Arkansas

**West Texas Flying Service**
Midland Airport
Midland, Texas

**Yingling Aircraft, Inc.**
Municipal Airport
Wichita, Kansas

## Climbs Over 1150 feet per minute . . .

No other plane can match the "performance per dollar" offered by this new Cessna—produced for Flying's Golden Anniversary Year. With full-range flaps—225 H. P. Engine—it fairly leaps from short fields, climbs at over 1150 feet per minute.

## Cruises at Over 150 m. p. h. . . .

You cruise comfortably at well over 150 m.p.h.—thanks to beautiful streamlining and such features as the new "jet tail" which eliminates trim tabs and reduces drag. Top speed is over 165 m. p. h. Range —over 4½ hours. Four can relax completely in the roomy, quiet cabin.

## Lands smoothly, safely, slowly . . .

Full-range flaps and finger-tip control make short-field landings easy. It's a plane any one can learn to fly. And its price is *more than one-third less* than any other make of plane in the over-150 m. p. h. class. See it at your Cessna dealer's . . . listed in your classified telephone book.

## America's Greatest Private Plane

# THE "GOLDEN YEAR"

# CESSNA 180

Cessna 180

Cessna Aircraft Company
Dept. FM-6
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Please send information on the new Golden Year Cessna. I am interested in a Cessna 170____, 180____, 190 Series____.

Name_____

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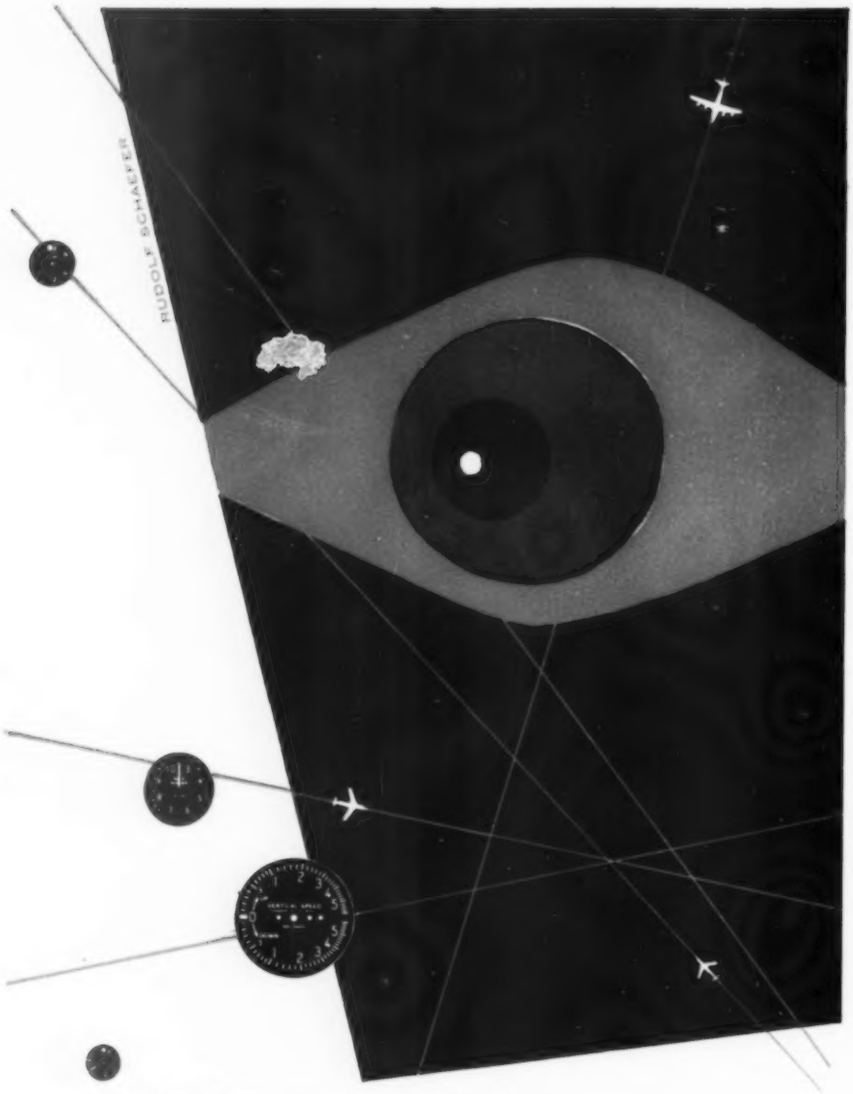
**ALSO SEE: The Cessna 170—America's largest-selling airplane . . . and the Cessna 190 Series.**

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Supplying the right answers to pilots and navigators by means of accurate, reliable instruments has been our work for more than twenty-four years.

- AIRCRAFT INSTRUMENTS AND CONTROLS
- OPTICAL PARTS AND DEVICES
- MINIATURE AC MOTORS
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Current production is largely destined for our defense forces; but our research facilities, our skills and talents, are available to scientists seeking solutions to instrumentation and control problems.

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Act. The sponsoring agreements which airport authorities are required to sign in order to get the Federal aid are now being interpreted by the CAA legal divisions so as to prohibit the airport authorities from granting operators a contract for tenure which would permit them to carry out a long-range operational plan.

Correspondence which I have had with a CAA regional attorney for my district indicates that it would be in violation of the sponsoring agreement for an airport authority to sell a site in the building area to an operator, for the reason that "under such circumstances, we would consider the sponsor, in giving up possession and control of that portion of the airport property, would be depriving itself of the necessary rights and powers."

Hence, the CAA policy on this problem may become somewhat of a paradox, inasmuch as CAA was charged by Congress to foster and promote aviation; yet, by making it impossible for operators to obtain security of tenure on airport sites the agency will hinder the development of an important segment of the industry.

At the present time, the National Aviation Trades Association is not prepared to recommend a specific solution to this problem. As soon as the survey of operator contracts has been completed, specific recommendations will be made, based on the findings of the survey. Meanwhile, all interested parties should obviously give further consideration to this problem.

One possible solution, which has been suggested, is that public funds be invested in airport buildings intended for private use. On its surface, this solution would appear to place the airport authority in the position where it would relieve the operator of making the large investment necessary for buildings; and, at the same time permit it to kick out the operator if the airport authority was not satisfied with his operation over a relatively short period of time.

However, careful consideration of this alternative will reveal its shortcomings. In the first place, it is doubtful that a large number of municipalities can legally spend public funds for the use of buildings for private purposes; or, if they can it would be difficult to justify such expenditures to taxpayers.

Even if the public expenditure of funds can be legally made and justified to taxpayers, the solution would have serious shortcomings. Publicly constructed hangars and shops would of necessity have to be of a general purpose type so they could be offered broadly to prospective tenants. On

the other hand, for the most efficient operation, buildings should be designed to meet the requirements of a specific operation; and, at the same time be flexible enough to meet changing requirements of the business, as well as expansion.

Finally, it would probably be difficult for the public authority controlling the airport to justify long term leases for the use of such buildings. Therefore, you would leave the operator pretty much in the same situation he now is. As a result, you would force him to continue to operate his business on a short-range basis.

It must be concluded that airport authorities must recognize that the aviation business is here to stay; and, that if they wish to assure their communities the maximum benefit from the expenditure of public funds on airports, they are obliged to grant to operators a security of tenure on sites which will avoid making them "fly-by-night" operations. ★ ★ ★

## RYAN'S JET TRAINER

*(Continued from page 61)*

production for the Navy; the Marbore is being converted to American standards for manufacture by Continental Aviation and Engineering Corp.

### Fuel Consumption

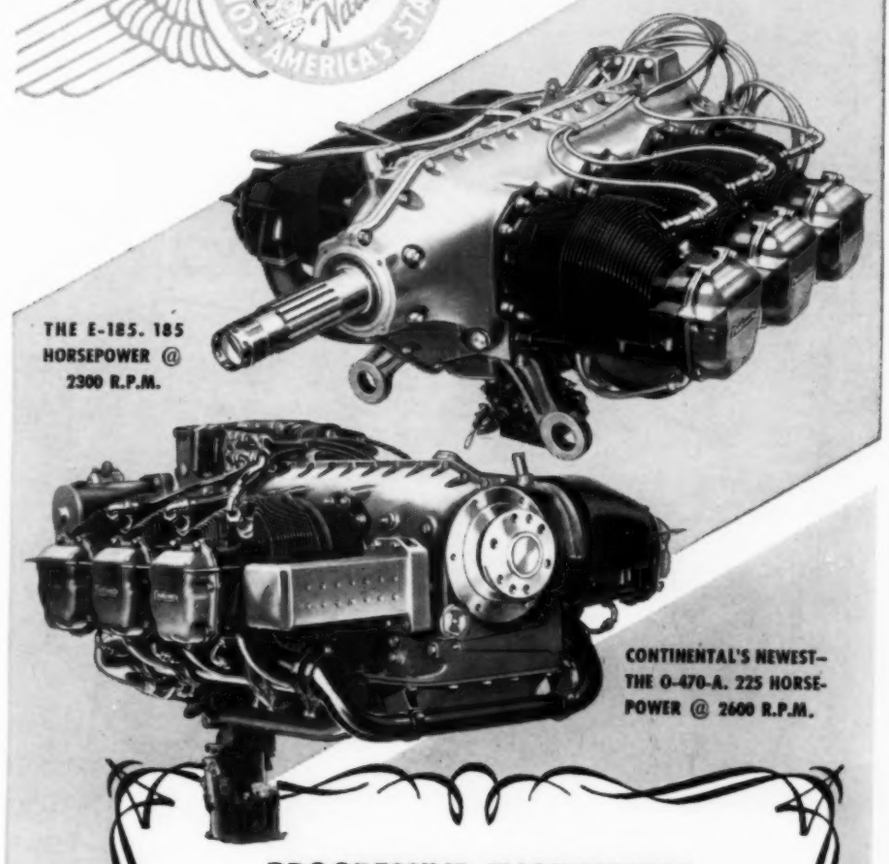
The Allison is a pure jet version of the T38 turboprop. It is rated at 1,870 pounds thrust at sea level and has a specific fuel consumption rate of .927 pounds of fuel per pound of thrust per hour. The Marbore is rated at 880 pounds thrust, with fuel consumption rate of 1.16 pounds.

The Ryan design provides for storage of all the fuel within the wing, reserving all the space to the rear of the cockpit for either one or two power plants. Sufficient room has been made available in the aft fuselage for any engine of a practical thrust range for this type plane. In effect, the flight "envelope" imposes no limitations in that it is not inextricably linked with any particular engine. Thus, even after such a plane has gone into mass production, the assembly line need not be disrupted by a change in engines.

As the line continues in operation, alternate power plants could actually be installed with no effect on the production rate. The Ryan design permits use of the same plane with either single or dual engine, depending on the requirements of the Air Force in its training program.

Ryan has had extensive experience with jet engines — more, as a matter of fact, than any other American air-


CONTINENTAL
AIRCRAFT ENGINES



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FIRST NAME IN UTILITY PLANE POWER

Continental Motors Corporation
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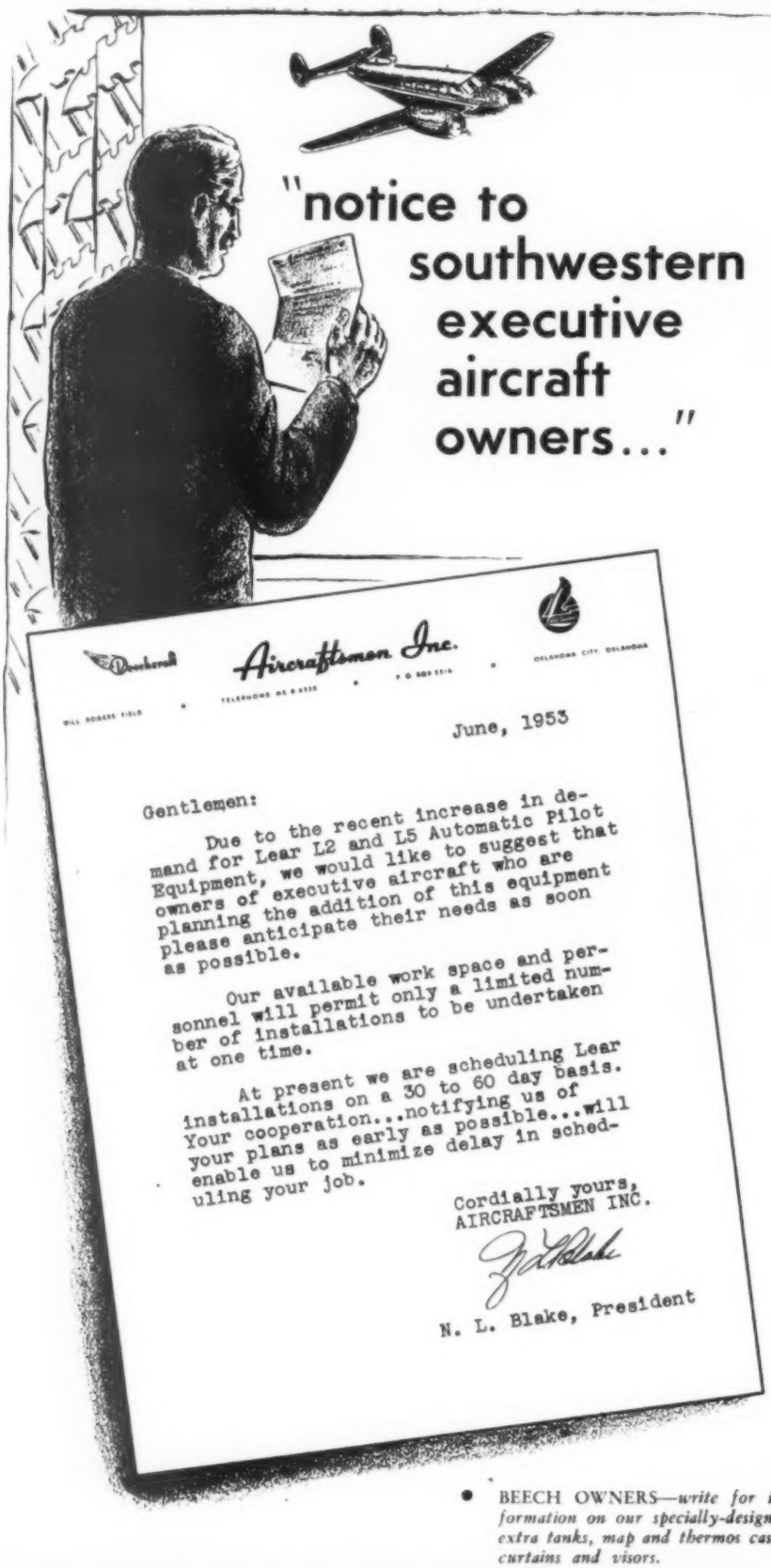
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southwestern
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owners..."
Aircraftsmen Inc.
June, 1953
Gentlemen:
Due to the recent increase in demand for Lear L2 and L5 Automatic Pilot Equipment, we would like to suggest that owners of executive aircraft who are planning the addition of this equipment please anticipate their needs as soon as possible.
Our available work space and personnel will permit only a limited number of installations to be undertaken at one time.
At present we are scheduling Lear installations on a 30 to 60 day basis. Your cooperation...notifying us of your plans as early as possible...will enable us to minimize delay in scheduling your job.
Cordially yours,
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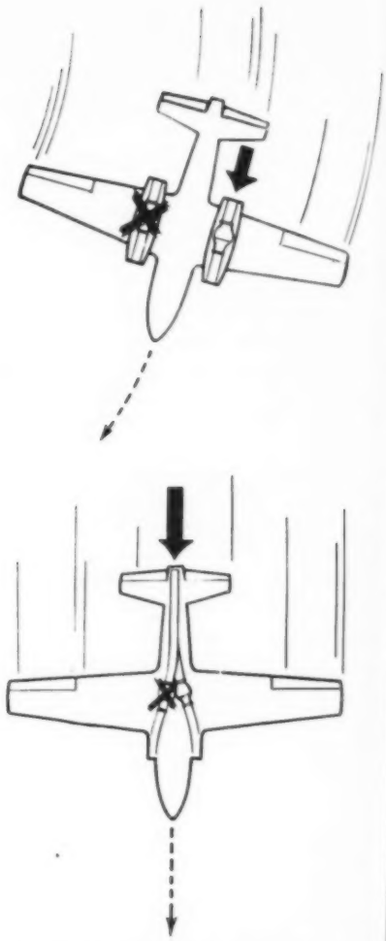

**Conventional twin-jet design (top) is affected by yaw when power is lost on one side. In Ryan design (bottom), installation of tailpipes one above the other eliminates this problem.**

frame firm with the French Marbore. The company's background of jet engine utilization completely spans both sides of the speed and power range of the Model 59. The Marbore engine has been extensively tested in the Ryan "Firebee," the sensational jet-propelled, pilotless, remote-controlled target plane which has been successfully flight tested for more than two years at the Holloman Air Development Center, Alamogordo, N. M.

Ryan also is unique in its experience with proven military planes containing two engines in the fuselage, instead of in the wing roots, to give yaw-free control with one engine inoperative. This was the trail-blazing FR-1 Fireball, the world's first jet-plus-propeller airplane and the Navy's first plane to use jet propulsion.

The front engine was a Wright Cyclone piston-type, while in the aft fuselage, for extra bursts of speed, was a General Electric I-16 jet engine. The Fireball could operate on one or both engines. Its successor, the XF2R-1 Dark Shark, was an all-turbine Navy research plane with a GE TG-10

turbo-prop in the nose replacing the piston engine, and the I-16 in the aft fuselage. The Dark Shark was the first Navy plane to use a gas turbine turning a propeller.

Two other prop-jet engine combinations were used by Ryan. The The XF2R-2, another model of the nose and a Westinghouse 24-C jet aft. The HF2R-2, another model of the Dark Shark, was to have the 24-C jet equipped with Ryan afterburner, combining with the TG-100 turbo-prop. Ryan's current high-thrust jet engine operation is in classified research projects which cannot be identified.

There is still another reservoir of experience on which the Ryan organization can draw — its fund of knowledge gained in the actual primary training of pilots for the Air Force. During World War II, some 14,000 fledgling fliers earned their wings in Ryan schools operated for the Air Force in San Diego and Hemet, California, and Tucson, Arizona. They learned to fly in the famed Ryan PT series of primary trainers, low-wing all-metal planes of which 1,500 were built for the Air Force and Navy.

### Jet Trainer Dimensions and Weights

The clean lines of the Model 59 bespeak simple construction. Wing span is 38.4 feet and length 28.04 feet. Empty weight is 3,700 lbs., useful load 2,292 lbs. and gross weight 5,992 lbs. With tip tanks, useful load increases to 3,602 lbs. and gross weight to 7,455 lbs.

The structure, readily disassembled, consists of six major components: the forward fuselage, aft fuselage, wing center-section, wing outer panels, wing tips and empennage assembly. In the aft fuselage is the engine tail pipe and supports for the tail surfaces. It is easily removable from the forward fuselage by a single bolt attachment at each of four longerons.

The wing center-section is continuous and is attached to the lower portion of the forward fuselage by four readily accessible bolts. Four integral fuel cells are located between the spars in the center section, one on each side outboard of the landing gear and one on each side of the center of symmetry inboard of the wheel wells. In addition, a readily removable leading edge fuel cell is provided on each side.

The outer wing panel is of conventional two-spar, rib-and-stringer construction. An integral fuel tank is provided between the spars. A one-piece, readily removable tip is provided, and it is possible to replace the wing tip with an external fuel tank.

★ ★ ★

GREER OIL RADIATOR TEMPERATURE CONTROL VALVE STAND is shown here checking operation of thermostatic control and surge relief valve used with aircraft oil radiators under low, normal and high temperatures. At right is the *Greer Vacuum Pump Tester* for testing complete performance of vacuum pumps.

GREER PORTABLE HYDRAULIC TEST MACHINE, shown in operation above, provides hydraulic test fluid under 3400 psi pressure and at flow rates up to 20 gpm for checking hydraulic system of modern aircraft on the flight line.

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**Airlines, like manufacturers, count on the accuracy and dependability of Greer equipment for important testing operations**

Greer Hydraulics, widely known for accuracy and dependability, has led the movement toward standardization of test equipment. Today, only in unusual applications must machines be designed to order. In most cases, equipment may be selected right out of the Greer catalog (write on letterhead for your free copy).

But standardization is not all the job. Keeping up is not enough; Greer engineers must stay ahead. Growing complexities of aircraft systems make ever greater demands on test equipment. Greer, pioneers in the field, must look far enough ahead to anticipate testing needs of the future.

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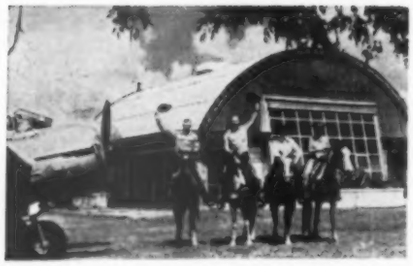


# Fly to the Flying L

## ...for Holidays in the Hills!

A happy haven for airmen — Texas' famous fly-in ranch where friends gather for fun. Your favorite sports. Superb guest cottages.

Cottage Rate:
$10 daily Amer. Plan
For overnight,
a week or a season.

**NEW LEAR CENTER FOR AIRCRAFT MODIFICATION AND ENGINEERING** has been opened at Clover Airfield in Santa Monica, California, to supplement the firm's operation at Grand Rapids, Mich. In addition to factory installations for radio and autopilots, the Santa Monica center will offer Lodestar modifications. Manager is Gerald Ehle, transferred from Grand Rapids, with Ed Swearingen as assistant manager.
—(Lear Photo.)

# Questions and Answers for Airport Operators

### One for the Birds

QUESTION: How in the world can a hangar operator get rid of the birds that nest on his trusses in the hangar? I would not mind the birds so much if they did not leave their remembrances behind them.

ANSWER: It's a good thing you wrote us that letter. In fact it sounds

*Engineers*

## AN INVITATION TO YOU TO GO PLACES WITH FAIRCHILD

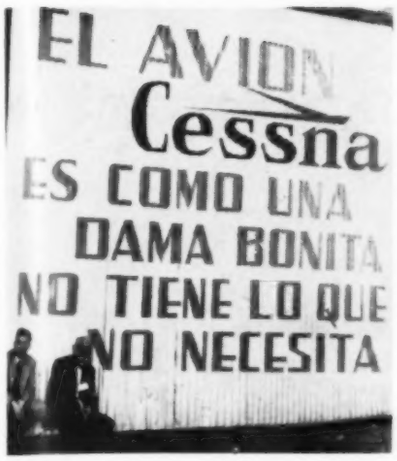
Roy W. Lessard, Assistant Chief of Design. Has had extensive aeronautical design and structures experience with many leading aircraft manufacturers and is part of the Fairchild engineering team.

A secure future, exceptional opportunities for advancement, and a high starting salary await you at FAIRCHILD. We have openings right now for qualified engineers and designers in all phases of aircraft manufacturing.

Paid vacations, liberal health and life insurance coverage, 5-day, 40-hour week as a base. Premium is paid when longer work week is scheduled.

ENGINE AND AIRPLANE CORPORATION
FAIRCHILD *Aircraft Division*
HAGERSTOWN, MARYLAND

YOU JACKS AND JILLS KNOW HOW NICE IT IS TO MAKE THE VARSITY IN ANY SPORT!.. THE CIVIL AIR PATROL IS AN OFFICIAL PART OF UNCLE SUGAR'S BIG BLUE TEAM — AND YOU CAN BE ON IT!
THE C.A.P. IS THE FIRST RESERVE LINE BEHIND THE FLY GUYS PACKING THE LIVE AMMO!.. GET WITH IT AND KNOW THAT YOU'RE CARRYING YOUR SHARE OF THE BALL!
For the gang in the CIVIL AIR PATROL...
With best wishes from STEVE CANYON and MILTON CANIFF
NEW YORK MARCH 1953




**SALESMANSHIP MEXICAN-STYLE** is represented in this picture of a hangar operated at Chihuahua, Mexico, by Leo Lopez, Cessna distributor. In English, the words read: "The Cessna airplane is like a pretty girl — what she doesn't have she doesn't need." Don Thrasher, Cessna's public relations manager, snapped the picture recently.

like we wrote it ourselves because just the past 30 days we heard of a new method of getting rid of birds in hangars. We have come to the conclusion that all we know that is new, we hear or see in the airports around the country, but this one is a new one to us. Please don't write in and say you knew this all along. About three week ago we were out in the new American Airlines hangar at Amon Carter Field, Fort Worth, Texas. There wasn't a bird to be found in the place. Comment was made out loud about that. Someone in the crowd told this story:

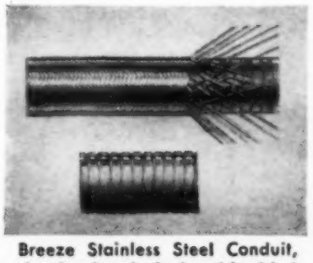
While the hangar was under construction, birds began to be troublesome. It was said they even pecked holes in the insulation. The way we got it some workman on the job said there was a way to get rid of them, and that way was to put a fist-sized gob of axle grease on a board and put it up in the beams. This was done in each corner of the hangar. The birds disappeared. Maybe they had to go to Capistrano anyway. The first question we asked was what kind of axle grease was it. Nobody knew but they said they would find out. Finally, over the weekend, it was discovered that the grease actually used was a product of Conoco so we called the Barney Holland Oil Company, distributors for the Continental Oil Company. We were told that it was Conoco Racelube and that it comes in 10-pound containers at a very modest price and that its use came about through an exchange of information between the contractor and Mr. Holland. It certainly appears to work. Maybe the birds don't like the smell although we got no whiff of the smell when we were in the hangar.

There is your answer. One robin does not make a spring but that is

IN NEW CONVAIRS, TOO

Power plant section of Convair 340, one of several Convair types that use Breeze Conduit.

BREEZE MARK Conduit and Fittings



Breeze Stainless Steel Conduit, showing interlocked and braided construction.

Like so many types and makes of military and commercial aircraft, latest CONVAIRS rely on BREEZE Conduit and Fittings, particularly in the *power plant sections*. In such applications high heat resistance is a critical safety requirement, and BREEZE heat-resistant, stainless steel conduit meets the most exacting specifications in this respect. BREEZE 198 Series Conduit is FIREPROOF – withstands temperatures up to 2000° F. for 5 minutes in accordance with CAA safety regulations, Release No. 259. Breeze Conduit and Fittings for ignition circuits or high tension applications is a production item, readily available in a wide range of sizes. Flexible conduit assemblies are made to specifications for any use.

BREEZE Flexible Metal Conduit

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*Aircraft Radio Corporation*
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Safe, drift-free, static-free OMNI gives you a reliable signal to follow, whatever your bearing. And ARC's compact Type 15D VHF Navigation Equipment makes OMNI available to executive aircraft of any size, as well as to private and transport aircraft. Just tune in OMNI and keep the needle of your ARC indicator on zero!

In addition to OMNI navigation, the 15D provides for use of the visual-aural ranges, and amplitude runway localizers. Add transmitter and receiver units of ARC's Type 12 equipment and you have independent, static-free voice communication.

*Whatever* your needs in navigation and communication, there is ARC equipment to meet them. Write today for all the details.

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**All ARC Airborne equipment is Type Certificated by CAA. It is designed for reliability and performance, not to meet a price. Installations for both single and multi-engine planes are made only by authorized service agencies.**

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**BOONTON, NEW JERSEY**
Dependable Electronic Equipment
Since 1928

**3,500TH BEECHCRAFT BONANZA OFF THE LINE AT WICHITA** went last month to Aircraftsmen, Inc., Beech distributorship at Oklahoma City. Left to right are Martha B. Lingenfelter, Beechcraft owner of Clinton, Okla.; Mrs. O. A. Beech, the manufacturer; and Norm Blake and Dutch Dutton of Aircraftsmen.
—(Beech Photo.)

the story. If you try it we hope it works. If it doesn't please complain to the birds. We are not sure how many of them read FLIGHT MAGAZINE.

### Heard in the Coffee Shop

The other day we had luncheon in an airport restaurant with a well known operator who has been in the business a long time. He told us of some of his current experiences and you probably would like to hear them, too. He's advertising in a modest way and for each weekend he points this advertising toward sight-seeing rides. He operates off a public airport in a town of better than a quarter of a million people, and he has been getting some customers for that service on Saturdays and Sundays.

He realizes that this particular type of promotion is not necessarily a money-making one because he feels that those who buy a ride should be given a good view of the town and a good clean ride. However, in doing this he feels he is promoting interest in the product he has to sell which includes a popular aircraft. This ride business appeals to a lot of kids and that brings the parents out. One boy and his father took a ride with him and it resulted in the father becoming a student.

This type of activity with the idea of promoting subsequent sales parallels the type of promotions which were current in the 30's and early 40's. As we go around we note new signs on other airports advertising sight-seeing rides.

One particular angle of our conversation was very interesting. He was mulling over the possibility of going back to "barnstorming" in this respect. He will take two or three aircraft on Sundays and hit the smaller towns with some advance advertising. We told him in all seriousness that he would be doing something essentially good for aviation if he would do this in the towns which had public airports upon which there were no operators, and gave him a list of them. Perhaps this type of fundamental thinking should be more widespread, taking people in the industry back to the bases on which they built their business in the early days. Perhaps people aren't as blasé about aviation as many think they are.

### Equipped Coffee Shop Available

Speaking of coffee shops brings up a reminder that Henry Nabors, city manager of Sweetwater, Texas, is interested in finding a man and wife to operate the well-equipped coffee shop in the new administration building at Sweetwater, Texas. Sweetwater is on Pioneer Air Lines and anyone interested should contact Mr. Nabors.


*Precision* . . .

In the Rebuilding of Aircraft Engines and Engine Accessories Is Essential to a Good Reputation. Our Customers Have Proven the Reliability of Engines and Accessories Rebuilt by . . .

**PRECISION AEROMOTIVE**
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MUNICIPAL AIRPORT — Milby-6636 — HOUSTON 17, TEXAS

## The Airport and Public Schools

Airport managers generally cooperate in many ways with civic movements and local activities in which the airport can obtain recognition. But more aggressive airport managers are always searching for something new in public relations. The latest development in this line comes from Lockheed Air Terminal at Burbank, California, the nation's busiest privately-owned commercial airport. It has published a colorful 12-page brochure, "Let's Visit the Lockheed Air Terminal," which was written and designed for school students.

The most interesting point about this brochure is that it is available to any airport anywhere, with its front and back covers "localized" to identify it with any town's local airport. The inside pages illustrate operations which are found on most airline terminal airports. The cost on a minimum order of 2,500 copies is 15 cents per copy and as little as 9 cents per copy on orders for 50,000 or more, this being printing cost only with no profit to Lockheed Air Terminal.

Airport managers should obtain a copy of the brochure for study. It can certainly suggest many interesting possibilities for use in the public schools. In fact, it was prepared with the advice and assistance of local and state school officials and the CAA. Copies and full details are available from Gordon Stanton, Public Relations; Lockheed Air Terminal, Inc., Burbank, California. He says: "We offer this brochure to any and all communities, regardless of geographical location, whether it be airport, airline, chamber of commerce or board of education—at our cost with no profit intended for Lockheed Air Terminal. It contains no Lockheed advertising except that some of the airplanes pictured in it are Lockheed designs."

On the back cover, which can be changed to tell your own local story,

TAKE A

"QUICKIE VACATION"

FILE YOUR FLIGHT PLAN FOR

EAGLE ROCK RANCH

Discover this fabulous, million-dollar ranch club for yourself . . . swim, golf, fish, ride, or relax in the luxurious air-conditioned clubhouse.

**2,600-foot CAA Approved All-Weather Landing Strip**

Just a short flight from anywhere in Texas to this resort paradise. Air strip is on your air maps.

**Year 'Round Holiday Homes**

Eagle Rock Holiday Homes and homesites available for those who want a picturesque hill country retreat, with all the facilities of a fine country club. Seeing is believing . . . fly up this week.

Write or wire for reservations
Attention Dept. F-1

**Eagle Rock Ranch Club and Resort**
**Wimberley, Texas**

HOME OF THE FAMOUS
Hawaiian Room
THE PERENNIALLY POPULAR
NEW YORK ADDRESS

Hotel Lexington
CHARLES E. ROCHESTER, President
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**FLŌTTORP REPLACEMENT BLADES CAN BE RE-TIPPED GIVING YOU EXTRA SAVINGS!**

Yes, Flottorp blades for Bonanzas can be re-tipped at **very** low cost! No need to buy a new set of blades when your Bonanza is equipped with Flottorp!

And, your set of replacement Flottorp blades gives added savings because a blade set costs as little as **$299.00!** Write for full information, or see your dealer.

**FLŌTTORP CONTROLLABLE PITCH PROPELLERS FOR 65 to 90 h. p. PLANES NOW AS LOW AS $189.00!**

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Zahn's Airport, Inc.
**Birmingham, Ala.**
Aero Service and Supply Co.
**Brownsville, Tex.**
Southwest Aviation, Inc.
**Compton, Calif.**
Nagel Aircraft Sales
**Dallas, Tex.**
Southwest Airmotive Co.
**Deer Park, L. I., N. Y.**
Mid-Island Air Service
**Englewood, Colo.**
Englewood Airport
**Fort Wayne, Ind.**
Wayne Aviation Corp.
**Henrietta, N. Y.**
Hylan Aircraft Supply Co.
**Huron, S. D.**
Dakota Aviation Co.
**Indianapolis, Ind.**
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**Palo Alto, Calif.**
Palo Alto Airport, Inc.
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National Aviation Supply Co.
**Robbinsdale, Minn.**
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**St. Cloud, Minn.**
Van's Air Service, Inc.
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Sacramento Sky Ranch, Inc.
**Santee, Calif.**
Southern Cal Airmotive
**Sioux City, Ia.**
Graham Flying Service
**Tampa, Fla.**
Airco Aviation Corporation
**Vancouver, Wash.**
L. W. Hubert
**White Plains, N. Y.**
Westair, Inc.
**Wichita Falls, Tex.**
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**Woodbury, N. J.**
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**Flōttorp Manufacturing Company**
Airport—Grand Rapids, Michigan
**World's Oldest Manufacturer of Aircraft Propellers.**

the original brochure puts across its own message like this:

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